

# ACQUIRING IMAGES

*Collecting Graphics to Use on the Web*

## In this chapter, you will:

- ◆ Learn to use scanners and acquire analog images
- ◆ Fix problem scans
- ◆ Learn about using cameras and taking photographs
- ◆ Retouch photographs
- ◆ Acquire images from other sources

**T**o produce a Web graphic, you must either create or acquire a bitmapped computer graphic. You can create an image by scanning an original drawing, using a paint program, or exporting an image from a vector-based program. Moreover, you can acquire photographs by scanning a photo, using a digital camera, or using stock photos from CD-ROMs.

After you acquire an image for a Web page, you should open the image in an image-editing program. As you examine the image, you might find problems such as artifacts—marks or other defects that are not part of the original image, but were introduced during acquisition. For example, film photographs can have scratches, and digital photographs can have artifacts created by digital compression. You correct problems such as these in an image-editing program where you can retouch photos to add or remove visual elements.

In addition to scanning images and taking photographs, you can find images in a variety of other sources. You can capture images from video, sketch them on a drawing tablet, or use images from stock photography CDs or other Web sites. This chapter explains how to acquire images and how to use Photoshop to correct any errors in the images.

## USING SCANNERS

Image production for Web graphics is similar to audio production—no matter how sound or image originates, it is edited and delivered in a digital form. All recorded music is recorded with either analog equipment such as magnetic tape, or digital equipment such as digital tape or computer hardware and software. Nevertheless, music now is almost always edited in a digital environment, and is delivered in its final form as a digital file on a compact disc.

In the same way, Web graphics can originate in an analog form such as paper, or in a digital form such as an electronic file, but they are edited digitally and displayed as a digital image file on a Web page. This means you must convert analog images from photos or drawings into digital images. One way to do this is to import the images using scanners.

A scanner is an optical input device that uses light-sensing equipment to capture an image from paper or other media, such as photographic slides. The scanner converts the image into a digital file that you can open and edit with graphics software. Scanners are the most versatile input device for Web graphics because you can use them to make digital files of photographs, hand-drawn illustrations, and any other flat images. As demonstrated in Table 4-1, flatbed scanners are excellent for digitizing images on paper or other flat media.

**Table 4-1** Acquiring original images with analog hardware and digitizing hardware

Image type	Medium	Digitizing method
Hand-drawn illustrations	Paper	Flatbed scanner
Photographs	Film print or slide	Flatbed or slide scanner
Vector image	Printout	Flatbed scanner
Video stills	Analog video signal	Video card or digitizing software

Flatbed scanners can import most types of analog images. If you can only have one device for inputting images, it should be a flatbed scanner.

### Using Flatbed Scanners

Flatbed scanners work much the same way as photocopiers, with two main differences. The controls for the scanner are software-based and are manipulated on the computer, and the output of the scanner is a digital image file, not a paper copy.

The hardware, software, and digitizing techniques used with flatbed scanners are discussed in the following sections.

## Flatbed Scanner Hardware

Flatbed scanners are affordable, most currently are available for a few hundred dollars, and many are available for under fifty dollars. Anyone seriously considering working with Web graphics should have a flatbed scanner. Although this was not true ten years ago, today even the least expensive scanners are adequate for most Web work. More expensive models have additional features that allow you to make color photocopies and send faxes.

To use a flatbed scanner to scan a drawing or photograph, generally from a book or paper document, you place the image on a glass surface. A scanning arm passes under the image, projects light through the glass and up against the image, and then registers the light that bounces back. The light then is captured as a digital image at a particular resolution.

Scanner resolution is based on pixels and measured in dpi (dots per inch) or ppi (pixels per inch). This measurement is linear, so a 300-dpi scanner scans at a density of 300 dots per inch horizontally across a page, and 300 dots per inch vertically down a page. A 300-dpi scanner actually generates 90,000 pixels per square inch. Scanning a full  $8\frac{1}{2} \times 11$ " sheet of paper creates a rectangular bitmap image 2550 pixels wide and 3300 pixels long. Web graphics tend to be much smaller, usually less than a few hundred pixels wide. Because your final output is much smaller than the sizes produced by a scanner, a scanning resolution of 300 dpi is adequate for large source images.

At times, however, your source image is quite small. For example, if you are scanning a photograph from a driver's license, which is typically  $1 \times 1\frac{1}{2}$ ", you need a resolution higher than 300 dpi. At 300 dpi, the driver's license photo produces a  $300 \times 450$  pixel image. Many photos develop scratches or wrinkles where they have been folded. Driver's license photos in particular tend to have many blemishes. To fix these blemishes, you need to scan at a higher resolution than you will use in the final Web graphic. You then can repair the scratches and reduce the image size. In general, you should scan images so that the image produced is at least twice the size you need. A 600 dpi scanner generates a  $600 \times 900$  pixel image (the size of a  $1 \times 1\frac{1}{2}$ " image), which is much larger than you need, but the image's higher resolution makes it easier to produce quality scans. Low-resolution scanners produce blurry images with less detail than high-resolution scanners. Currently, 600-dpi scanners also are inexpensive, and are the standard resolution for flatbed scanners. You need at least 600-dpi resolution to scan small source images. You also can find 1200-dpi scanners on the market, and the newest hardware scans at even higher resolutions. More resolution produces better scans. When purchasing a scanner, buy one with the highest resolution you can afford.

## Using Scanning Software

Some scanners are set up to be used within image-editing applications such as Adobe Photoshop. In this case, you start Photoshop, click File on the menu bar, point to Import, and then click the name of the scanner. Other systems are set up so that you have to scan in one program, such as Ofoto, and then you save the image and open it in another program to edit.

Before software can send or receive data to and from devices such as printers or scanners, the computer needs a type of software called a driver. **Drivers** are software interfaces that let computers and external devices communicate with each other. Driver software is vendor- and device-specific, so you need a particular driver for a particular scanner. These drivers should come on a disk with the device, or they are available on the Web site of the device manufacturer.

Most major graphics hardware and software companies have agreed on a cross-platform standard for scanners known as TWAIN. (TWAIN does not stand for anything, although many say it is an acronym for Technology (or Toolkit) Without an Interesting Name.) Adobe is a member of the Twain Working Group, and Photoshop supports TWAIN-compliant scanners.

You often can find a default driver to use instead of the one intended for the particular hardware. However, using the right driver often produces better scans.

### Using a Scanner to Create an Image File

Scanner operation depends on which scanner you use and how your computer is configured. However, because scanners and the software that drives them are similar, you can follow the steps below to scan a document with most scanner setups.

First check the scanner's user manual to see if you can import an image directly using Photoshop, or whether you have to use additional software. If you plan to edit the image with Photoshop, it is more convenient to scan using Photoshop. Otherwise you have to import the image in one program, save it, and then open it again in Photoshop.

To scan a document:

1. Turn on the scanner. If necessary, let it warm up.
2. Open the document cover lid on the scanner. Make sure the glass is clean and free of dust. To clean the glass, first check the owner's manual for the manufacturer's recommendations. Using certain chemicals or ordinary paper towels can leave marks on the glass.
3. Place the image face down on the glass. If you are scanning from a book or magazine, make the paper as flat as you can by pressing on the lid or weighing it down with a book. Do not put too much weight on the glass, however, as you could damage it.
4. Start the scanning software or an image-editing application such as **Photoshop**.
5. In Photoshop, click **File** on the menu bar, point to **Import**, and then select your scanning device.

You can import scanned images directly from any scanner that has a Photoshop-compatible driver or that supports the TWAIN interface. See your scanner documentation for instructions on installing the scanner plug-in.

If your scanner does not have an Adobe Photoshop-compatible scanner driver, but supports the TWAIN interface, select **TWAIN Acquire** from the Import submenu.

If you can't import the scanned image using TWAIN, or you are not using Photoshop, use the scanner manufacturer's software to scan and save your images, and then open the files later in Photoshop or ImageReady.

6. Use the **Selection** tool to choose only the part of the document or image you want to scan. It wastes time and disk space to scan the whole document if you need only a portion of it.
7. Use as much resolution and color as possible without producing a file that is too large to manage. If you are scanning a black-and-white image, use 8-bit grayscale for the color depth. If you are scanning a color image, use 24-bit RGB color. You should see an estimated image file size that will be produced by the current settings. If you use maximum settings, you might produce an image file that is too large to edit easily. Adjust the selection area, color depth, and resolution so that the output image is a manageable size, such as 1 MB.
8. Press the appropriate button on your scanner or in the scanning dialog box; such as one labeled **Scan**, **Start**, or **Process**, to start the scan. As the scanner digitizes the document, leave the lid down and do not nudge the scanner. The scanning arm moves slowly. If the scanner is jostled during a pass, it can miss areas of the document and the resulting image might show wrinkles of missing information.
9. When the scan is completed, use the software to save the image file in a high-color, noncompressed format such as TIF or PSD. PSD is the proprietary format for Photoshop. Both formats support 24-bit color and do not create compression artifacts the way JPEG does.

To save the image in Photoshop, click **File** on the menu bar, and then click **Save**. In the Save dialog box, click the **Format** list arrow, click **TIFF (\*.TIF)** or **Photoshop (\*.PSD, \*.PDD)**, and then click **Save**.

The file produced by a scanner is a computer image. If the original document contains text, the text in the produced image is graphical and cannot be edited. You can use additional Optical Character Recognition (OCR) software to convert scanned text into text that you can edit. However, the accuracy of this software is less than 100%, and the text files that the software generates usually contain many errors.

## Using Slide Scanners

Flatbed scanners are excellent for digitizing images on paper and other flat surfaces, such as transparency film, but they cannot scan slides. Photographic slides are attached to a cardboard or plastic frame so you cannot press the slide itself flat on the glass of a flatbed scanner. A slide scanned with a flatbed results in a dark, muddy image.

A different type of scanner, called a **slide scanner** or **film scanner**, does work with photographic slides and negatives. Instead of placing the slide on a sheet of glass, you insert the slide into the slide scanner. Unlike scanned paper documents, slides are a uniform size, so slide scanners position the scanning mechanism directly against the film. Slides usually have a higher resolution than printed photographs, so slide or film scanners also must provide better resolution than generally provided by flatbed scanners. Slide scanners also produce a more accurate image because they light the slide from behind, through the slide and into the sensors. Flatbed scanners project light against the image and the light bounces back into the sensors. Flatbed scanners have less accuracy sensing the light, and lower resolution than slide scanners.

Slide scanners are not as common as flatbed scanners, but are crucial for high-resolution images, such as an online archive of artwork or photographs. Slide scanners are simple boxes, with only a slot for inserting the slide. They are controlled by scanning software in the same way as flatbed scanners. Slide scanners are usually more expensive than flatbed scanners. High-quality slide scanners cost between \$300 and \$2000.

## Using Drawing Tablets

To use a drawing as a Web graphic, you can either use a pointing device such as a mouse to draw the picture in a graphics program, such as Photoshop, or you can draw it on paper and then scan the drawn image. Both methods have drawbacks. Drawing with the mouse is clumsy because you don't have the same control as you do with a pen. Drawing on paper requires the additional step of scanning the drawing after it is created. An alternative is to use a drawing tablet, an input device that lets you use an inkless electronic stylus to draw directly on a sensitive panel. Moving the stylus over the panel produces a line similar to one created with a mouse or other pointing device. Drawing tablets eliminate the need for producing paper versions of illustrations. Instead of using the mouse, you draw with a stylus, which is similar to traditional drawing tools such as pencils or pens. This flexibility makes a drawing tablet a handy tool for creating and editing Web graphics.

A drawing tablet is particularly useful if you retouch a lot of photos. In Photoshop, a stylus provides you more precise control over retouching tools such as Dodge, Blur, and Airbrush than using a mouse. Not only is a stylus more comfortable and familiar in the hand than a mouse, but many allow you to adjust line weight based on how much pressure you apply.

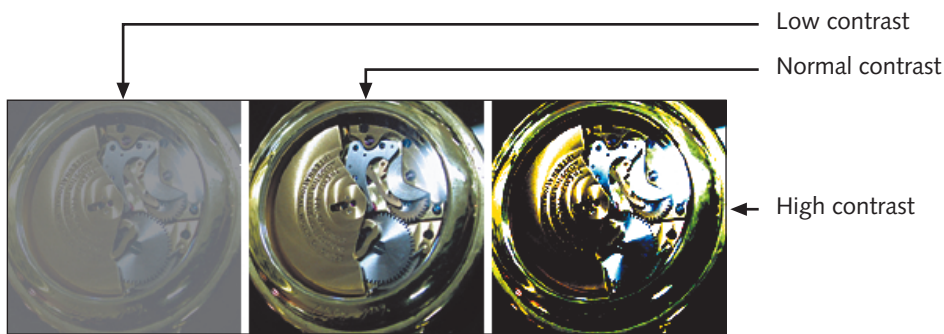
## FIXING PROBLEM SCANS

After you scan an image and open the image file in an image editing program, you might notice problems or flaws. Some might reflect defects in the source image, but most probably were created during the scanning process. Typical problems include low contrast, incorrect colors, stray marks or artifacts, and unexpected patterns of pixels. The following sections explain how to solve these common image problems.

### 4

### Fixing Low Contrast

Scanned images often have low contrast. The white areas are not truly white and the black areas are not truly black. Figure 4-1 shows an image with low, normal, and high contrast.

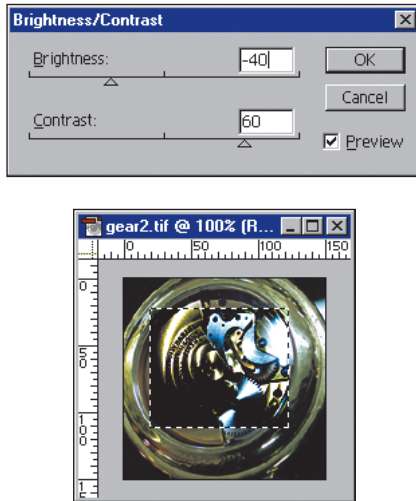


**Figure 4-1** An image with different contrasts

You can solve the image contrast problem in Photoshop by using the Brightness/Contrast dialog box.

To adjust contrast using the Brightness/Contrast dialog box:

1. Click **Image** on the menu bar, point to **Adjust**, and then click **Brightness/Contrast**.
2. In the Brightness/Contrast dialog box, illustrated in Figure 4-2, make sure the Preview box is checked so you can see how changing the brightness and contrast affects the image.
3. Enter new values in the Brightness and Contrast text boxes. You also can drag the Brightness and Contrast sliders to change these values.
4. Click **OK** to close the dialog box and apply your changes to the image.



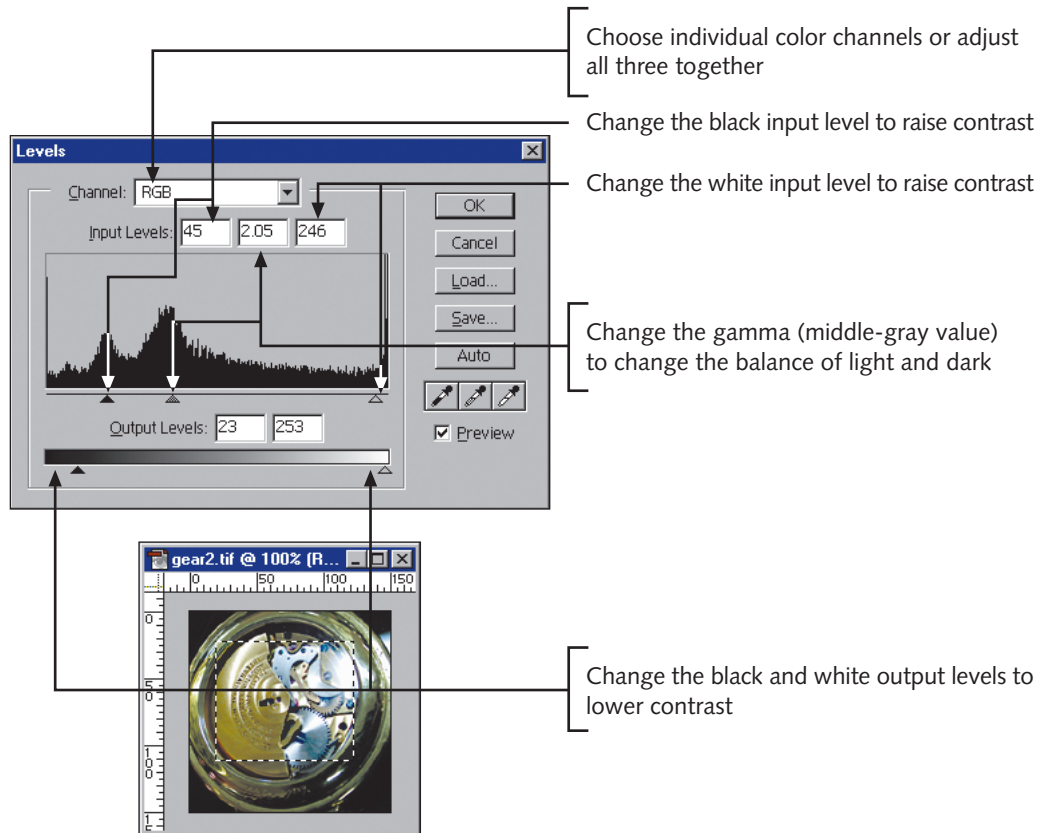
**Figure 4-2** The Brightness/Contrast dialog box

Photoshop also has another, better tool that gives you more control over image contrast: the Levels dialog box. Use the Levels dialog box to adjust intensity levels of the shadows, midtones, and highlights in an image.

To adjust contrast using the Levels dialog box:

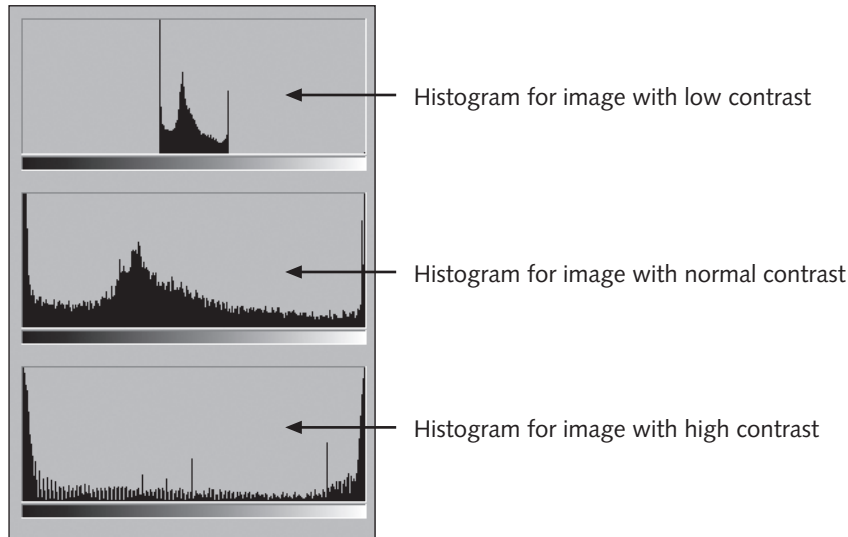
1. Click **Image** on the menu bar, point to **Adjust**, and then click **Levels**.
2. In the Levels dialog box, illustrated in Figure 4-3, make sure the Preview box is checked so you can see how changing the values affects the image.
3. To increase contrast, change the Input Levels by entering new values in the first and third Input Levels text boxes, or by dragging the first and third Input sliders.
4. To alter the lightness balance, adjust the gamma by entering a new value in the second Input Levels text box, or by dragging the second Input slider.
5. To decrease contrast, change the Output Levels by entering new values in the Output Levels text boxes or by dragging the Output sliders.
6. Click **OK** to close the dialog box and apply your changes to the image.





**Figure 4-3** The Levels dialog box

The Levels dialog box shows a graph called a histogram. The **histogram** is a visual representation of all the pixels in the image. The scale along the bottom represents brightness with pure black at the far left, white at the far right, and middle-gray or **gamma** in the middle. Look at the histogram, and you can see how the pixels in the image are dispersed across the brightness continuum. If part of the histogram is empty, the image has no pixels of that shade. If the empty pixels are at the far left or right of the histogram, the image has low contrast. Figure 4-4 shows histograms for the images shown in Figure 4-1. The first image has very low contrast, and the histogram shows no pixels at the far ends of the spectrum. The third image has very high contrast, and the histogram shows most of the image information concentrated at the ends. The second image has normal contrast, and the histogram shows evenly distributed image information.



**Figure 4-4** Histograms for images with different contrasts

For images with low contrast, you should **normalize** the contrast. To do this, set the darkest colors of an image to pure black and the brightest colors to pure white. To normalize contrast, you remove the blank areas at the far ends of the histogram by dragging the slider arrows to reset the image's minimum and maximum levels.

In Photoshop, you also can use the **Auto Contrast** or **Auto Levels** tool to normalize contrast. Auto Contrast simply maps the lightest pixel in the image to pure white, and maps the darkest pixel to pure black. Auto Levels alters each color channel separately, normalizing the red, green, and blue channels independently. Use Auto Contrast for grayscale images and simple contrast normalization. Use Auto Levels for more precise normalization of color images. To use these features, click Image on the menu bar, point to Adjust, and then click Auto Contrast or Auto Levels. If the image seems too dark or light with optimized contrast, open the Levels dialog box as described earlier and adjust the gamma slider (the gray center slider arrow) in the Levels dialog box. If the contrast is too high, you can lower it by adjusting the Output Levels sliders at the bottom of the Levels dialog box.

## Fixing Problem Colors

You might find that the colors in a scanned image are not as bright as in the source image. For example, the colors in the scanned image in Figure 4-5 look washed out.

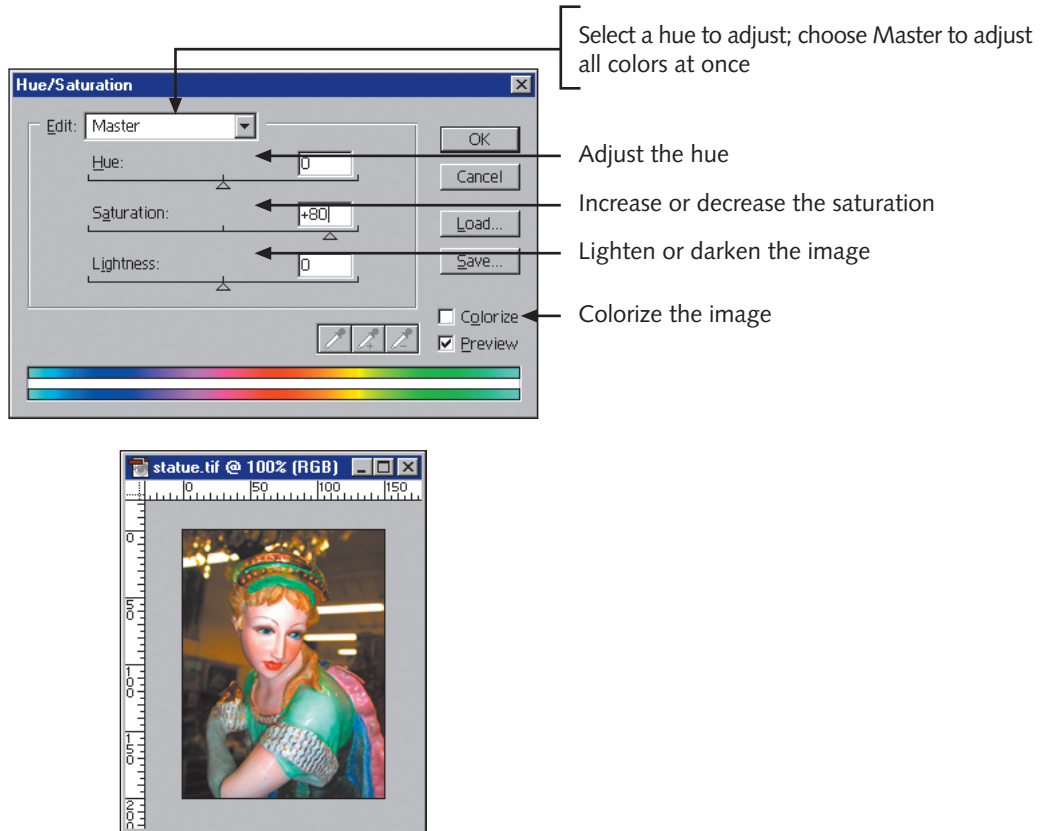


**Figure 4-5** A color scan with washed out colors

Washed out colors are a common problem when the source is printed on low-quality paper. In Photoshop, use the Hue/Saturation tool to solve muddy color problems.

To adjust color using the Hue/Saturation dialog box:

1. Click **Image** on the menu bar, point to **Adjust**, and then click **Hue/Saturation**.
2. In the Hue/Saturation dialog box, illustrated in Figure 4-6, click the **Edit** list arrow and then click the colors you want to adjust. For example, if only the reds are dim, click **Reds**. To change all the colors, click **Master**.
3. To make the selected colors more saturated, drag the **Saturation** slider to the right, or enter a positive value in the Saturation text box.
4. To dim the selected colors, drag the **Saturation** slider to the left, or enter a negative value in the Saturation text box.
5. Click **OK** to close the dialog box and apply your changes to the image.



**Figure 4-6** The Hue/Saturation dialog box in Photoshop

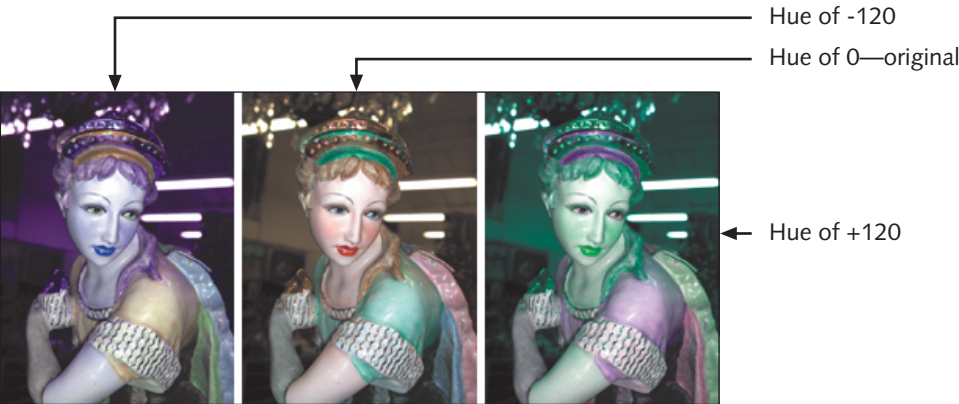
Scanned images occasionally have a magenta or green blotch where the paper was not flat against the scanner bed during scanning. Use the Hue/Saturation dialog box to eliminate this problem.

To eliminate magenta or green scanning defects:

1. If the image already includes magenta or green, use a Marquee selection tool to select the area you want to adjust.
2. Open the **Hue/Saturation** dialog box, click **Image** on the menu bar, point to **Adjust**, and then click **Hue/Saturation**.
3. Click the **Edit** list arrow, and then click **Magentas** or **Greens**.
4. Set the lightness to 100% by dragging the **Lightness** slider to the right, or by entering **100** in the Lightness text box.
5. Click **OK** to close the dialog box and apply your changes to the image.

### Adjusting HSV Color

A common way to describe color is **HSV: Hue, Saturation, and Value**. Photoshop often refers to value as brightness or lightness. Hue refers to the color itself and is measured from -180 to +180, where red is equal to 0. This numbering system comes from the color wheel convention, which has every hue placed in a circle. Each hue has a unique value equal to one of the 360° of the circle. Figure 4-7 shows the effects of changing the hue of an image.



**Figure 4-7** Changing the hue of an image

In Photoshop you adjust the hue with the Hue slider in the Hue/Saturation dialog box (see Figure 4-6). For this slider, and for many of Photoshop’s color tools, Red is equal to 0, and the other colors continue up to 180 or down to -180, which are both equal to cyan. Table 4-2 shows the colors and their corresponding hue values.

**Table 4-2** Hue values

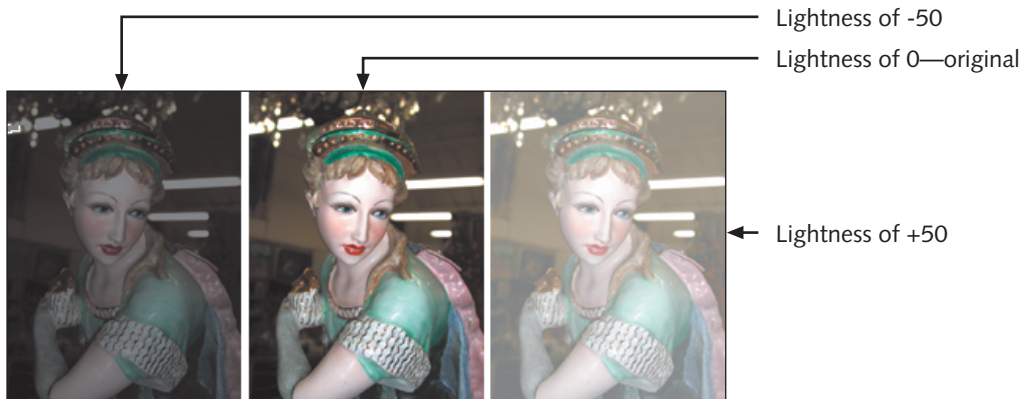
Cyan	-180
Blue	-120
Magenta	-60
Red	0
Yellow	60
Green	120
Cyan	180

**Saturation** refers to how much of a color the image contains and is measured in percentages from -100% to 100%. If a color already is saturated, increasing the saturation has no effect. Setting saturation to -100% turns the color to an equivalent shade of gray. Figure 4-8 shows the effects of changing the saturation of an image.



**Figure 4-8** Changing the saturation of an image

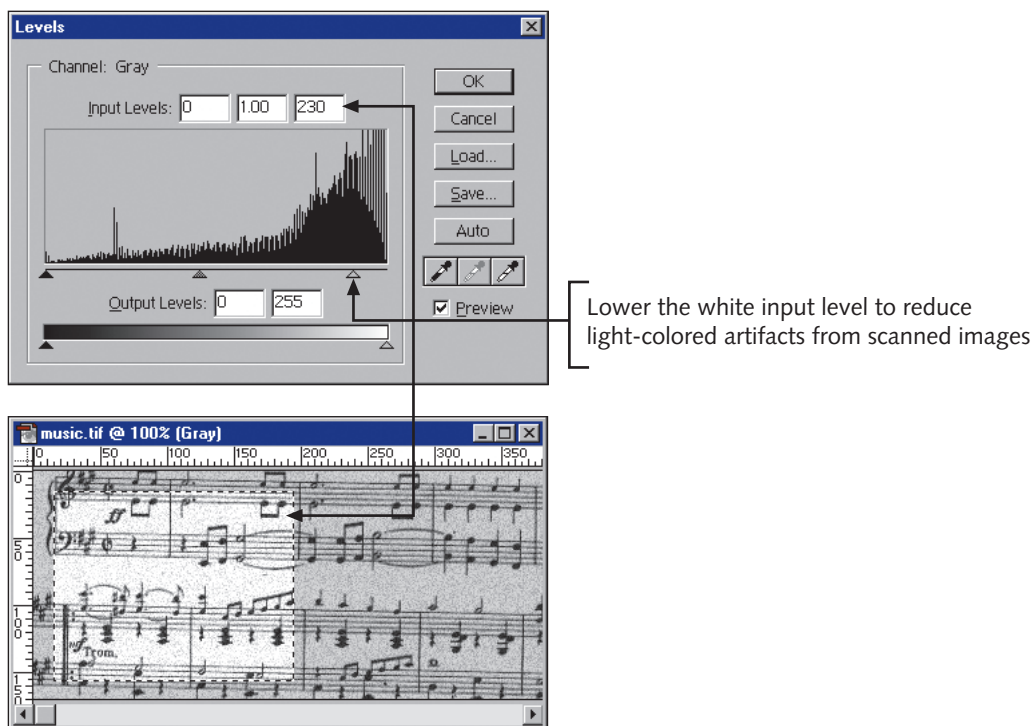
**Lightness** indicates how light a color appears and is measured in percentages from -100% to +100%. Lightness indicates how much black or white is in a color. A lightness of -100% is black, and a lightness of 100% is white. Figure 4-9 shows the effects of changing the lightness of an image.



**Figure 4-9** Changing the lightness of an image

## Removing Artifacts

Scanned images, such as drawings or printed figures, with white backgrounds often have small blemishes as a result of wrinkles or defects in the paper or dust on the scanner bed. These show up on the histogram as a peak in the far right of the graph, which indicates many pixels of light gray or off-white. To remove these blemishes, open the Levels dialog box and then move the white slider to the left of the peak. This sets all pixels lighter than the value in the rightmost Input Levels text box to 100% white. This method works only when the defects are lighter than the image itself. Figure 4-10 shows a scanned image with scanning defects and the histogram of the image.



**Figure 4-10** Removing artifacts with the Levels dialog box

To correct blemishes that are as dark as the colors in the image, edit them with the Eraser tool.



## Removing Patterns

When you scan a picture from a magazine or any other low-resolution print image, the dithered ink pattern is visible in the scanned image. In Figure 4-11, the original image has been scanned, producing a patterned image. These are called Moiré patterns and are caused by the scanning resolution interfering with the resolution of ink dots on the image. The patterns appear as series of dots over the image.



**Figure 4-11** A scanned image with visible Moiré patterns

To fix a Moiré, you blur the dots and soften the edges between the dots and the rest of the image. One method is to blur the entire image. Photoshop has several types of blur filters; the Gaussian Blur filter provides the most blur control. (To use this filter, click Filter on the menu bar, point to Blur, and then click Gaussian Blur.) With the Gaussian Blur filter, you can adjust the radius of the blur around each pixel. A higher radius means more blur. For most tasks you want a radius between 0.3 and 1. The drawback of using a blur filter to remove unwanted patterns is that you remove detail in the entire image, not just the unwanted pattern.

Besides blur filters, Photoshop also provides noise-reduction filters to add or remove **noise**, which Adobe defines as pixels with randomly distributed color levels. Noise filters remove defects such as dust and scratches from an image.

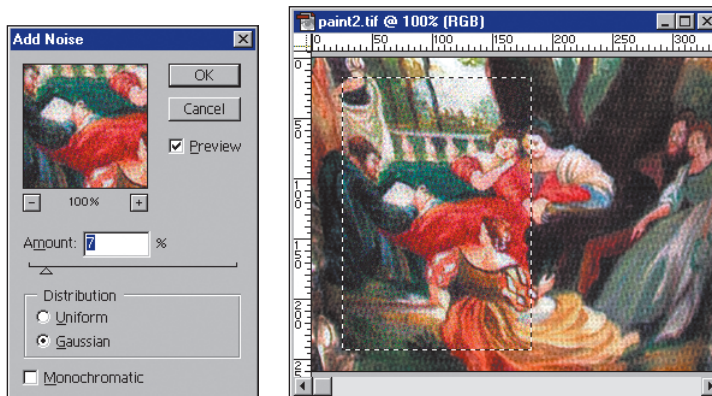


The Despeckle and Add Noise tools are two noise filters. You use the Despeckle tool to blur only the dots, and the pixels immediately around the dots. This removes patterns without affecting other detail in the image. Choose Despeckle (click Filter on the menu bar, point to Noise, and then click Despeckle) to find the edges in the image, and blur everything except the edges. The Gaussian Blur tool gives the most control for blurring images, but the Despeckle tool produces the best results when removing patterns from scanned images.

Another way to eliminate patterns is to actually add more noise using the Add Noise filter. Although adding noise to an image does not make it any clearer, it can reduce the appearance of regular patterns. The noise appears as a random pattern of dots over the image. The dots are of varying lightness and help mask existing patterns.

To eliminate patterns by using the Add Noise filter:

1. In Photoshop, click **Filter** on the menu bar, point to **Noise**, and then click **Add Noise**.
2. In the Add Noise dialog box illustrated in Figure 4-12, drag the **Amount** slider, or enter a value in the Amount text box to add noise to the image.
3. Click the **Uniform** option button to distribute noise in a uniform pattern across the image. Click the **Gaussian** option button to distribute noise in a speckled pattern, which produces a stronger effect.
4. Select the **Monochromatic** check box to show only black-and-white noise. Click the **check box** to clear it if you want the noise to be various shades of all colors.
5. Click **OK** to close the dialog box and apply your changes to the image.



**Figure 4-12** Adding noise to an image

An image with highly visible Moiré patterns might not be salvageable. In this case, try scanning the image again at different resolutions to avoid patterns.

## Solving Problems with Video Capture Stills

Besides print, the other type of analog media you might need to digitize is video. To capture video clips or stills, you need special hardware and/or software which digitizes an input connection from a TV or VCR. The newer Macintosh computers and many Windows computers have this hardware and software preinstalled. How to capture a still from a video input depends on the system you have and is beyond the scope of this book. The following sections include a few tips to improve video-capture stills.

### Boosting Colors

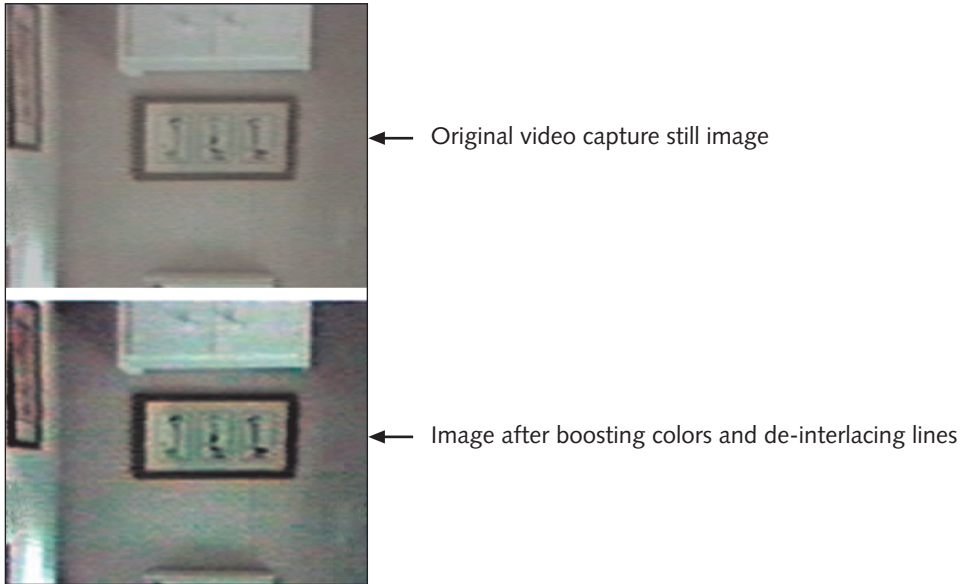
Television screens cannot display colors as saturated as those on computer monitors, so a bright TV image appears dull as a captured still. Use the Auto Levels dialog box to normalize the contrast, as discussed earlier in Fixing Low Contrast. Additionally, use the Hue/Saturation dialog box to increase the saturation of the colors, as discussed earlier in Fixing Problem Colors.

### Removing Lines

Video displays 30 **frames** per second; each frame is composed of two **fields**, each appearing at 1/60 of a second. One field contains the even-numbered lines of the image, and the other field contains the odd-numbered lines; each field contains only half the image. When you watch video on a television, the even and odd fields appear so quickly that they seem to be a complete interlaced image. However, a captured video still shows separated horizontal lines. The lines are actually two images 1/60 of a second apart, interlaced together. If the original video had movement in it, the difference between the fields is more significant and the interlacing is exaggerated. To remove this effect, use the Photoshop De-interlace filter. (Click Filter on the menu bar, click Video, and then click De-Interlace.) This filter removes one of the fields by removing either the even- or odd-numbered lines, and then fills in the gap with interpolated lines from the other field.

A standard video still is 640 pixels wide and 480 pixels high. By de-interlacing you remove half of the lines, so you should reduce the image dimensions to 320 × 240 to maintain a sharp image. (In Photoshop, you do this with the Image Size dialog box.) Figure 4-13 shows a video capture still before and after boosting colors and de-interlacing lines.

Digital video does not produce the interlacing effect. Instead of displaying 60 fields per second like analog video, digital video displays 30 frames per second. Each frame is a complete bitmap image that contains all necessary lines.



**Figure 4-13** Fixing colors and lines in a video frame capture

### Reducing the Effect of Motion

Just as you use the Blur or Despeckle filters to reduce patterns in scanned images, you use the Median filter to reduce the appearance of motion in photographs or video stills. The Median filter finds pixels of similar brightness and replaces the pixel between those pixels with an average of the surrounding pixels. To use the Median filter, click Filter on the menu bar, click Noise, and then click Median. This opens the Median dialog box, which shows a preview of your image and a slider for you to control the amount of motion reduction. This tool helps only when the appearance of motion is subtle. If an image has a lot of motion blurring, consider using a different image.

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## TAKING PHOTOGRAPHS

In the early years of the Web, including photographs on a Web page was a three-step process: use a camera to store an image on film, develop the film, and then scan the print. This technique is still pervasive and effective, but digital cameras provide a quicker option. With a digital camera, you capture the image directly as an image file, and don't have to record the image onto a file. Although the resolution of most digital cameras needs to catch up to the resolution of most film cameras, acquiring images is a one-step process with digital cameras.

The drawback of traditional film photography is that the image is locked into the medium—paper or slides. Prints can be retouched with airbrushing, but this post-production is time-consuming and can be performed only by experienced professionals.

The advent of the desktop computer and the desktop publishing revolution of the late 1980s, including the development of quality digital image editors such as Adobe Photoshop, changed photography again. Digital image editors let almost anyone manipulate photographs in ways previously reserved for experienced professionals.

As a Web graphic artist or designer, you might receive photographs as digital files, prints, or slides. You scan the photos or receive them in digital format, and then prepare them for the Web by editing them in an image-editing program such as Photoshop or ImageReady. If you work at a site, such as an online magazine, that handles lots of photographs, it's likely that someone else shoots the photographs. However, if you work at a small company, or one that doesn't have many photographs, you must be able to use a camera yourself to acquire images.

## Using Film Cameras

Film cameras produce the highest resolution images possible. Although you display images on the Web at a low resolution, acquiring Web images with film cameras is valuable because these cameras are inexpensive and easy to use. You should familiarize yourself with the standard hardware, terminology, and developing techniques for working with film cameras.

### Film Camera Hardware

Because image resolution on the Web is relatively low compared to print work, almost any point-and-shoot camera produces adequate images for Web work. However, when purchasing a camera and film, you should know the basic terminology defined in the following sections.

**ISO** ISO refers to film speed, which is a measure of the light sensitivity of the film. ISO is an abbreviation for the International Organization for Standardization, which assigns universally accepted ratings for different types of photographic film. A low number such as 100 means the film is appropriate for the bright light of outdoors; a higher number such as 400 is more sensitive and appropriate for darker indoor shots. Choose a film with the appropriate ISO rating for what you plan to photograph.

**F-Stop** F-Stop is a number that indicates the size of the camera's aperture, or opening that admits light. In bright light you close the aperture to create a sharper image. In low light you open the aperture to let in more light, though this lessens the detail.

Most consumer-quality cameras make aperture adjustments automatically. This makes it easy to create good photos in most lighting conditions. If you want more control over the lighting of your pictures, use a camera with manual f-stop adjustment.

**Single-Lens Reflex** Single-lens reflex (SLR) means the camera has only one lens for light to pass through. The light is sent to both the viewfinder and the film, so what you see is exactly what appears on the film. Inexpensive cameras have one lens to pass light to the film and a separate window for the viewfinder. What you see through the viewfinder of an inexpensive camera is not exactly what is recorded on the film. This difference is exaggerated at very close and very far distances. Single-lens reflex cameras use a series of mirrors to take some light from the lens and bounce it to the viewfinder. This lets you see exactly what will be registered on the film. SLR cameras produce superior results compared to non-SLR cameras. If you can afford the extra expense, and you plan to use a lot of high-quality photography on your site, consider buying an SLR camera.

## Developing Film

After you take photographs with a film camera, you develop the film to produce slides, prints, or a photo CD. If you need high-quality Web images, such as product shots or other large detailed photos, develop slides, not prints. For other images, develop a print and scan it.

If you want slides, remember to use slide film to capture images on film and a slide scanner to import them into the computer. If you want prints, choose the highest quality paper available. High-color prints on quality paper create better scanned images than those on low-quality paper such as newsprint.

A relatively new option is to develop your film to a photo CD, where a film developer scans the negatives and produces high-quality digital images. This is an inexpensive and time-saving way to store many photographs in a digital format. The high storage capacity of a CD also makes it easy to archive photos. Having film photos developed onto a CD produces images of higher resolution than you can acquire from a digital camera or from scanning prints.

Scanning slides yields the highest resolution images; developing your prints as a photo CD creates the next highest resolution; and scanning prints produces the lowest resolution.

## Using Digital Cameras

Professional photographers used to avoid digital cameras, which could not even approach the resolution of film. Now, however, you can create true print-quality images from the top-of-the-line digital cameras. Digital cameras save time when you are creating photographic images in a digital environment. Unlike film cameras, inexpensive digital cameras produce images with resolution too low for some Web graphic tasks. Choose a digital camera that produces at least 1-megapixel images, as discussed in the following section.

Before you purchase a digital camera, you should familiarize yourself with the hardware, terminology, and production techniques involved in working with digital cameras.

Film cameras record visual information on chemicals. This allows the resolution to be as fine as the individual molecules of silver nitrate on the film. Digital cameras have

much coarser resolution based on pixels. When evaluating digital camera hardware, consider the highest resolution the cameras can produce, how they store images, the type of zoom they use, and whether they let you adjust virtual ISO.

## Digital Camera Resolution

The resolution of digital cameras is often measured in **megapixels**; a megapixel is equal to one million pixels. The number of pixels is calculated by multiplying horizontal pixels by vertical pixels. For example, a digital camera that produces images which are 1280 pixels wide and 1024 pixels high can register 1,310,720 per image. Such a camera is described as a 1.3 megapixel camera.

When you select a digital camera to use to create source images for Web graphics, resolution should be your first concern. A camera that produces only  $640 \times 480$ -pixel images doesn't have enough resolution. Try to select a digital camera that produces at least 1-megapixel images. Even though these images are as large as an average computer screen, the detail in final Web graphics is sharper when you have larger source images.

## Storing Images on a Digital Camera

Digital cameras save an image as a digital file to an internal disk or to a removable memory device called a **flash card**. Flash cards range in size from 2 MB to 40 MB. The smaller cards let you store only one or two high-resolution images.

To maximize the number of images saved on a disk or card, many digital cameras use lossy JPEG compression to reduce the size of the image files. However, this also reduces the quality of the images. Unless you have to take many photos at once, you should turn off the JPEG compression or at least set it to highest quality.

Because the flash card in a digital camera provides a finite amount of storage, most cameras let you store either several low-resolution images or a few high-resolution images.

## Using Digital Zoom

Film and digital cameras both rely on lenses to focus light and use zoom lenses to magnify faraway subjects. Some digital cameras offer **digital zoom**, which doesn't require additional lenses and is an inexpensive alternative to standard **optical zoom**. Digital zoom crops the center of the image, expands the dimensions, and interpolates pixels. Images produced by digital zoom have much less detail than optical zoom images.

## Setting Virtual ISO

Because digital cameras do not use film, lighting and film speed aren't major concerns, as they are with film cameras. However, many digital cameras still use ISO to indicate light sensitivity. You can adjust this virtual ISO to simulate ISO numbers as high as 1000, which lets you take pictures in very dim light.

## PHOTOGRAPHIC TECHNIQUES

With analog photography, you must take great care when composing a shot. Once the image is locked into the medium of film, you can do little to change how it looks. With digital tools such as Adobe Photoshop, however, the composition of the shot is not as important because you can manipulate the image later on your computer.

However, you must follow the basic rules of image composition, because many aspects of photography cannot be repaired once the shutter snaps. For example, you cannot completely solve most poor lighting problems in post-production, so you must use proper lighting in the first place. In addition, you must carefully position the camera and subject when taking the photo, because you cannot change those factors afterward.

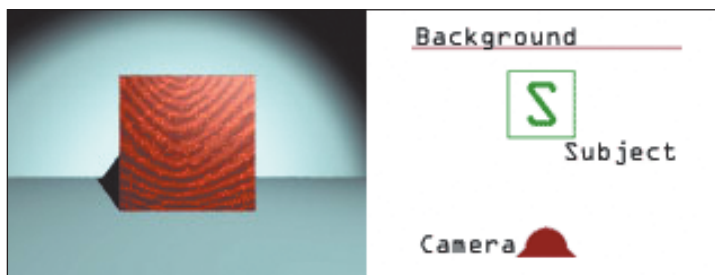
The following sections describe the basic rules of image composition.

### Emphasizing the Subject

You take a picture because it has important visual features that you want others to see. Perhaps you're taking product shots for an online catalog, or collecting portraits for the staff bio page. Either way, you want to highlight the important and distinguishing features of your subject. You can emphasize these features by how you use angles and how you light the subject.

#### Using Angles

In general, shots you take from oblique angles are more informative than head-on shots. Most beginners simply shoot the front of the subject, disregarding anything on the sides. This can be effective in a photograph of a person, but does not create much interest or convey much information in other kinds of photographs. In Figure 4-14, the angle is straight-on and the sides and top are hidden from the viewer. With the camera at a 0° angle to the subject, only the front face is visible.

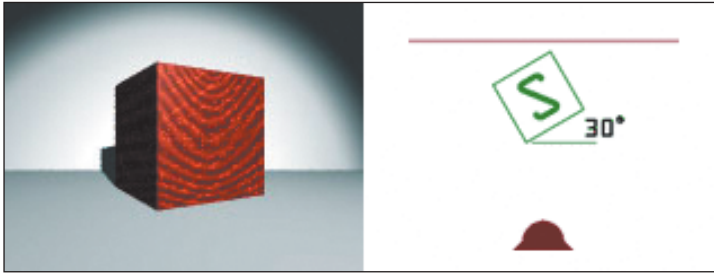


**Figure 4-14** The camera at a 0° angle

By placing the subject at an angle to the camera, you make relative sizes visible. Additionally, the diagonal lines in such an image make the overall composition more

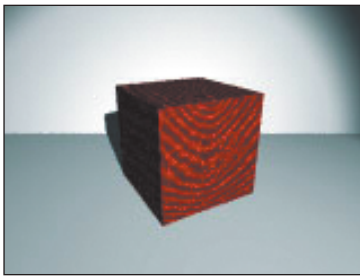


dynamic. For most images, placing the subject at 30 degrees from the camera, as illustrated in Figure 4-15, is sufficient to create visual interest and communicate information. If you have a subject such as a car, where the sides are just as important as the front, a 45° angle is more effective because it lets you show as much of the car as possible. For a product such as a computer monitor, the front has most of the information and a 15° angle might be more appropriate. Rotating either the subject or the camera's perspective by about 30 degrees reveals more information.



**Figure 4-15** The camera at a 30° angle

For product shots, you can raise the camera 30 degrees above the subject to capture details from the top, as shown in Figure 4-16. By moving the camera this way, three sides become visible.



**Figure 4-16** The camera at 30° to the side and 30° above

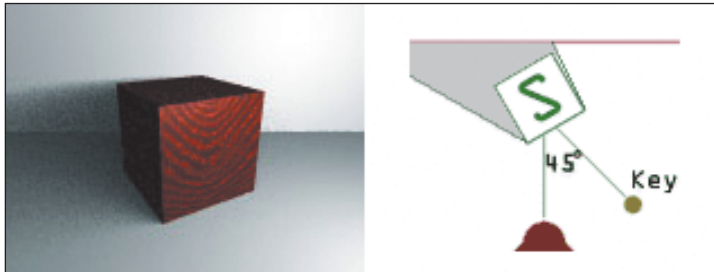
## Lighting the Subject

Poor lighting is nearly impossible to fix in digital post-production, so it's important to light the subject effectively during the shoot. You can use a convention for lighting called 3-Point Lighting, which uses up to three lights. This lighting convention maximizes illumination and minimizes shadow.

The **key light** provides the most illumination of the subject. Direct the key light at the primary area of interest on the subject. Angle the key light about 45 degrees away from the camera to minimize glare and define the shape of the subject. If possible, use a diffuse

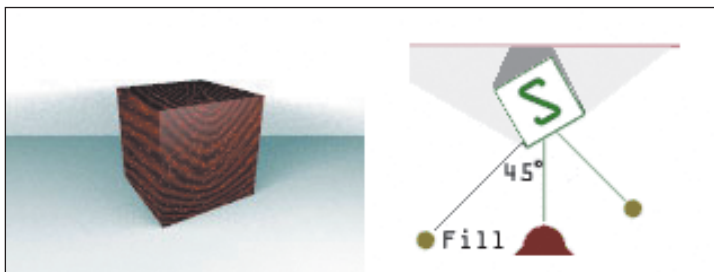


light source to avoid harsh shadows. Figure 4-17 shows an object illuminated with a single key light. If you don't have access to professional lighting equipment, natural light from a window provides the most diffuse light and produces the best colors. If you have a choice, a slightly overcast day produces good light because clouds diffuse the light and eliminate harsh shadows. The more cloud cover, however, the less saturated the color, and the depth of focus will decrease. If you have to use indoor light, incandescent light (from light bulbs with filaments) produces warmer colors than fluorescent lights, which give subjects a bluish or greenish tinge.



**Figure 4-17** The key light

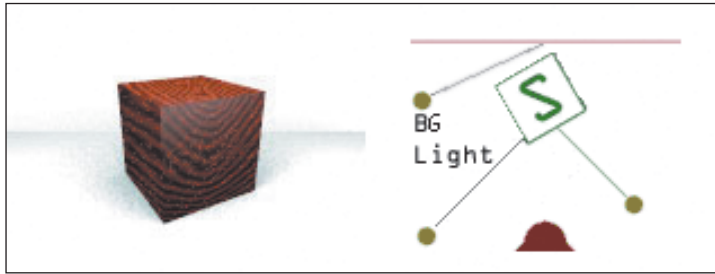
The key light usually produces strong shadows when used by itself, and might not illuminate the whole subject. You use a **fill light** for secondary illumination. Place a fill light on the opposite side of the camera from the key light to fill in or illuminate some of the shadows left by the key light, as illustrated in Figure 4-18. The fill light should not be as bright as the key light. Either use a weaker light source, or place it farther away from the subject than the fill light. If you are using light from a window for your key light, position the fill light on the opposite side of the subject to light the subject from both sides. If your indoor light is fixed, position the subject between the key and fill lights so that it is illuminated on both sides. A fill light reduces some of the shadows cast by the key light.



**Figure 4-18** A fill light

You also can use additional lights called **back lights** or **point lights** to highlight specific areas of the subject. The fill light might not illuminate all the shadows cast by the key light, and might cast shadows of its own. Use point lights to illuminate shaded areas. Some modern photographers use fiber-optic cables to direct precise points of light. Point lights are most necessary when you take photos in a building with only overhead fluorescent lights. A small, directed incandescent light eliminates some shadows from overhead lights and creates warmer colors on the subject.

As stated, the fill light can create shadows of its own, and cannot fill in all the shadows left by the key light. Point lights illuminate specific areas. To fill in any remaining shadows, use a **background light** projected not on the subject, but on the background. Figure 4-19 shows how using back lights and background lights helps to reduce shadows and adds depth to an image.



**Figure 4-19** A background light

## Deemphasizing the Background

As you probably know, the foreground is the subject of your photograph, while the background is whatever is behind the foreground. The background should not interfere with the foreground, but it can provide context for the subject or make the image more interesting. The ideal background has a different color and lightness from the subject, and has little texture to distract the viewer's attention.

To deemphasize outdoor backgrounds, you usually can adjust the focus and aperture on the camera so that the foreground is in sharp focus and the background is a little blurry. Make sure background objects; such as those that appear directly behind the subject, do not interfere with the subject. For example, a portrait with a telephone pole sticking out of a person's head looks silly. Position the subject so that only areas of color or texture (not objects with discrete edges) surround the subject.

You have more control over the background in indoor shots. You can use a background for context or interest's sake. For example, a plain white background makes the overall image seem dull, while subtly-colored or lightly textured fabric makes it more interesting. Use a background with low texture and colors that contrast with the subject to help the subject stand out. Avoid highly colored or intensely textured backgrounds, which draw attention away from the foreground. Also avoid backgrounds that have a color similar to the subject's.

In Figure 4-20, the background on the left side of the figure is blurry and darker than the foreground. This accentuates the subject and draws attention toward it. The background on the right side of the figurine has a lot of detail and bright colors. These compete with the foreground for attention and distract the viewer from the subject.



**Figure 4-20** Background texture and color affect the appearance of the subject

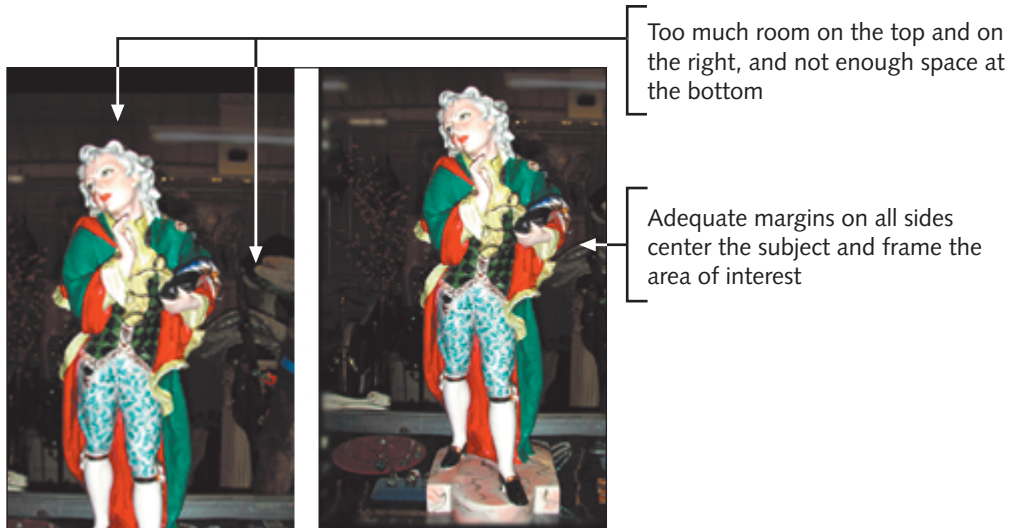
## Making the Image Interesting

Not only should the image provide visual information about the subject, it should be attractive or interesting enough so that people want to look at it. These terms are subjective, as there is no single standard for attractiveness. However, following a few fundamental rules can help make an image more interesting. Use margins, follow the rule of thirds, use diagonals, keep the image balanced, and maintain contrast to create visual interest.

### Use Margins

When taking photos of people, many beginning photographers center the person's head in the image. This composition seems balanced in the viewfinder, but it leaves the upper half of the photo empty. Although you can crop a photo later in an image editor, you can compose a more appealing photo by shooting closer to the subject so that the top of the head is just below the top of the image. Be sure to leave plenty of headroom or you might crop off the top of the head. Include margins between the edges of the photo and the subject to frame the foreground. Your goal is to make the background spacing around the subject symmetrical, give the subject plenty of space in the composition, and include all of the visual information you need to communicate your message. A rule of thumb for margins is to leave left and right margins equal to about one-fifth the width of the subject, and leave a top and bottom margin equal to about one-fifth the height of the subject. If you know you'll have large margins, extra space near the bottom is more visually appealing than extra space near the top.

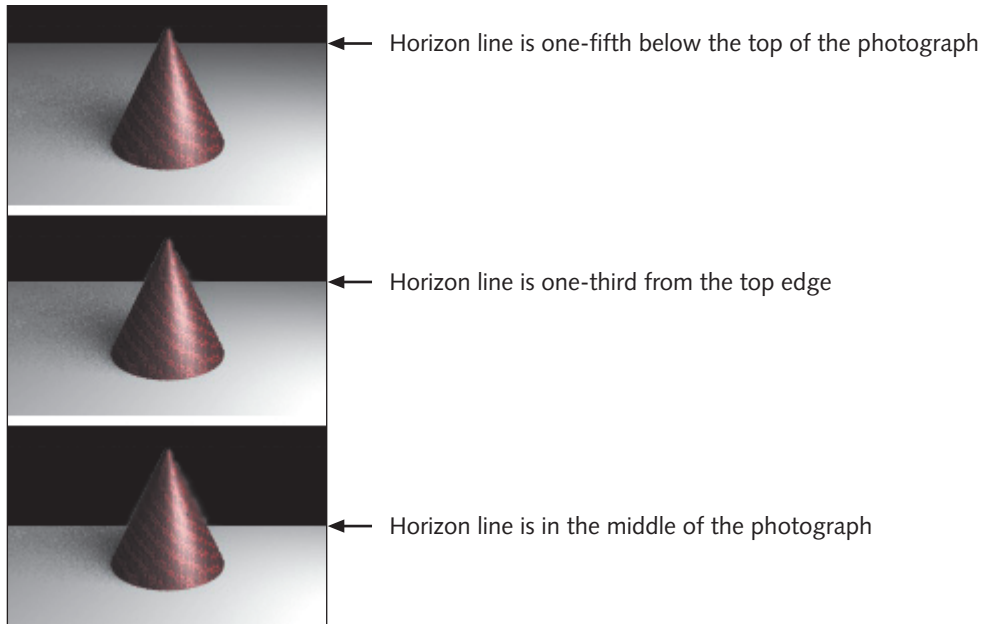
In Figure 4-21, the image on the left has too much room on the top and on the right, and not enough space at the bottom. The image on the right has enough room on all sides to center the subject and frame the area of interest. The left margin is larger than the others, but helps frame the primary area of interest, the face of the figure.



**Figure 4-21** Contrasting use of margins

### Follow the Rule of Thirds

Whether you are shooting outside and have a real horizon or are shooting objects on an indoor countertop, a horizontal line often intersects the image. By positioning the subject and the camera, you control where the horizon crosses the image. Position the camera so that the horizon line crosses one-third of the way down from the top, or one-third of the way up from the bottom. This is known as the **rule of thirds**. Follow this rule to add interest and balance to a picture and make it more dynamic. In Figure 4-22, the image on top has the horizon line at one-fifth below the top of the photograph. This creates the illusion that you are looking down on the object. The image at the bottom has the horizon line at the middle of the photograph, which results in a somewhat duller image. The image in the center has the horizon one-third from the top edge. This makes the image more interesting.

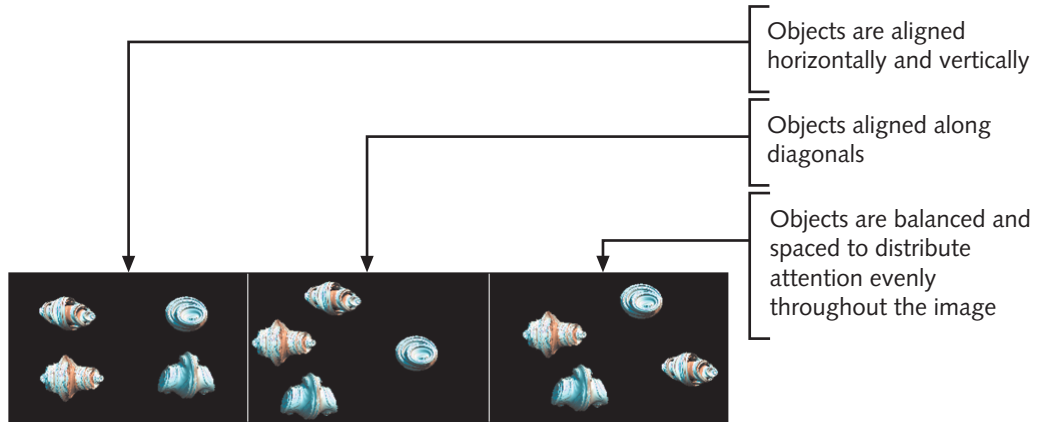


**Figure 4-22** The rule of thirds

### Use Diagonals

Diagonal lines catch the eye more than vertical or horizontal ones. By angling the subject or the camera, the edges of the subject create diagonal lines on the image.

When we see, we tend to group visual elements together and connect imaginary lines between elements. If you position two objects in an image next to each other at the same height, or one directly above the other, the imaginary lines connecting them are simple horizontal or vertical lines. This composition is not as interesting as when you position the objects at different heights, creating imaginary diagonal lines between the objects. A diagonal composition is more dynamic. In Figure 4-23, the objects in the left image are aligned horizontally and vertically, which creates a dull composition. The objects in the center image are aligned along diagonals, which adds interest and directs the viewer's attention (in this case, to the object on the right). The composition of objects in the right image uses balance and spacing to distribute attention evenly throughout the image.

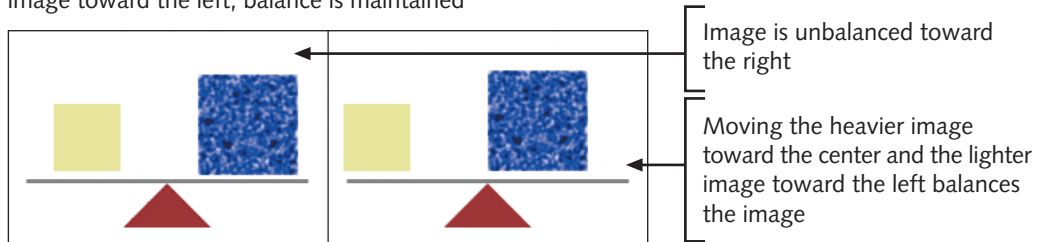


**Figure 4-23** Objects with three different alignments

### Keep the Image Balanced

Balance means keeping the focus of an image near the center so that the viewer's attention does not drift away from the image, and so that it does not appear as though something is missing from the image. If you have one subject and a plain background, you normally would center the subject. If you have multiple subjects in the foreground, though, you want to make sure the picture is balanced. Think of the bottom of the image as a seesaw, and every distinct shape in the image as a weight; bigger elements, darker elements, and more textured elements are heavier. For a small child to balance a large child on a seesaw, the small child must be at the end and the large child must be near the fulcrum. If both children sit the same distance from the center, the large child causes an imbalance. In Figure 4-24, color, texture, and size all add visual weight to elements in an image. The image on the left seems unbalanced toward the right. Moving the heavier image toward the center and the lighter image to the left maintains the balance among the objects.

The image on the left appears unbalanced toward the right. By moving the heavier image toward the center and the lighter image toward the left, balance is maintained



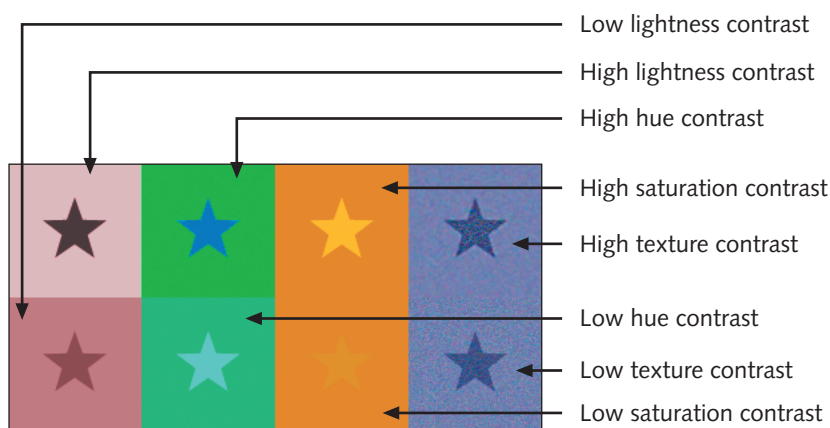
**Figure 4-24** Balanced and unbalanced images

## Maintain Contrast

One reason for setting up lights is to reduce glare and strong shadows. However, you don't want to completely eliminate these elements. They help give the subject a three-dimensional look and add interest to the image. Shadows create contrast, which makes an image visually interesting. You can use the following forms of contrast in your photographs:

- *Lightness contrast:* Light-colored objects show up better on dark backgrounds, and dark objects show up better on light backgrounds. If you can control the background, make sure it contrasts with the subject. If you can control the lighting, light the foreground and background so that the foreground stands out from the background. Lighter objects against a dark background stand out better than dark objects on a light background. Dark colors recede into an image, while light colors stand out.
- *Hue contrast:* In addition to lightness, the hue of the background can make the foreground stand out. A pink object against a red background creates lightness contrast, but no hue contrast. A better background would be dark green or blue. Choose hues that are opposite each other on the color wheel. In general, red and green are considered complementary opposites, as are blue and yellow. Because light colors against dark backgrounds stand out better than dark on light, use hues that support this idea. If you have a blue object against a yellow background, for example, the blue object recedes into the yellow, making the background the primary point of interest.

- *Saturation contrast:* Sometimes the foreground and background have similar hue and lightness, and the subject does not stand out. To resolve this, change the contrast between the saturation of the hues. If the blue and yellow in the image have the same saturation, for example, the yellow stands out. If you brighten the blue and lessen the saturation of the yellow, the blue stands out.
- *Texture contrast:* Use texture to draw focus to the subject and away from the background. Highly textured objects are noticed more easily than areas of flat color. Try to make your subjects more textured than the background. By adjusting the focus of the camera, you can make the background blurred, which reduces the visual texture. Figure 4-25 shows examples of high and low contrast of lightness, hue, saturation, and texture.



**Figure 4-25** Lightness, hue, saturation, and texture contrast

## RETOUCHING PHOTOGRAPHS

Photograph retouching used to involve airbrushing away unwanted elements, and using pens and sponges to reduce the appearance of scratches. Modern image-editing software gives you far more control than these traditional techniques. Instead of painting over areas of an image, you can adjust the color of individual pixels. The following sections discuss the tools and techniques you can use in Photoshop to retouch photographs.

Most digital photo-retouching tools are similar to the ones used to treat photo prints. Terms such as airbrush and sponge reflect the actual objects used for retouching film photography. Photoshop provides a variety of brushes to retouch photos, and provides selection tools to precisely select what you want to retouch.

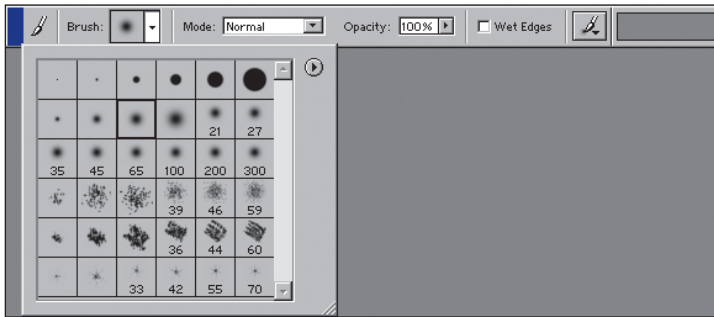


## Using the Photoshop Brushes

Most of the tools you use to retouch photos are either painting tools or editing tools, and all use brushes. You can adjust the size and softness of the mark left by the brush in the Options bar when you select one of the painting tools. Open an image you want to retouch, and then follow the steps below.

To adjust the size and softness of a Photoshop brush:

1. Click the **tool** you want to use. For example, click the **Paintbrush tool**.
2. Make sure the Options bar is open. To open the Options bar, click **Window** on the menu bar, and then click **Show Options**.
3. On the options bar, click the **Brush list arrow** to see the Brush menu, as illustrated in Figure 4-26.

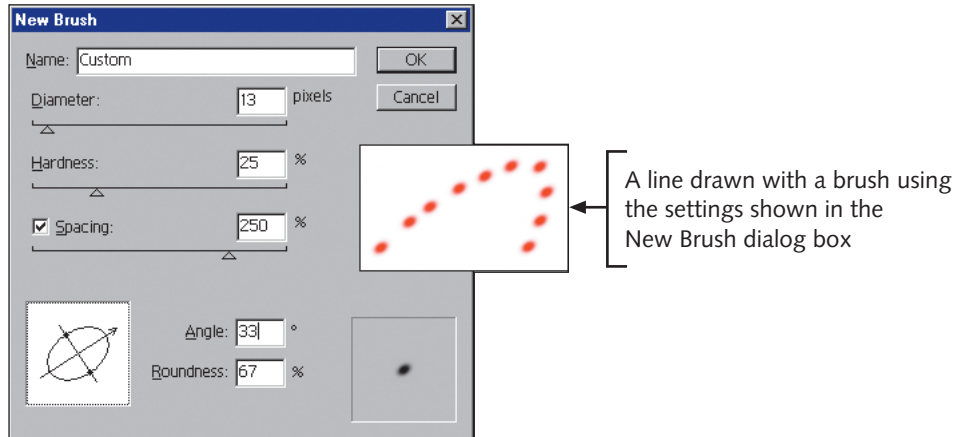


**Figure 4-26** The Brush menu in the Options bar

4. Choose a **brush size** from the Brush menu.
5. Point to the open image—your pointer reflects the size and shape of the brush.

Brushes usually are round, but can be any shape. The Spatter and Chalk brushes create artistic effects.

6. To load a new set of brushes or create new brushes, click the **right triangle button** on the Brush menu, and then click **New Brush** to open the New Brush dialog box, shown in Figure 4-27.



**Figure 4-27** The New Brush dialog box

7. Change the settings described below, and then click **OK**. A new brush icon then appears in the Brush menu.
- The diameter of the brush stroke in pixels
  - The hardness of the brush, where 0% is very soft and 100% is hard. A soft edge means the brush stroke fades to transparent.
  - The spacing of the line. Anything over 100% creates a dotted line.
  - The angle of the brush head, which matters only if the brush has a different roundness
  - The roundness ranges from a normal 100% round brush, to an elliptical shape, to a 0% calligraphic brush.
8. To edit the settings for an existing brush, click the **brush icon** in the Options bar. This opens a menu with the same choices as the New Brush dialog box.

For photo retouching, you almost always want a round brush with a soft edge. Using a brush with a hard edge makes the edits more visible. The brush size depends on the accuracy you need for the particular task.

## Using the Photoshop Selection Tools

You use the selection tools almost every time you use Photoshop. Before you can perform most tasks with a part of an open image, you first must select that part. When you select an area of the image, you see an animated dashed line, called a marquee, indicating the selected area. When you use a brush to edit the image, the changes occur only

within the selection. You can select an area in a particular shape or according to similarities among pixels. You can set most selection tools to be anti-aliased or not. (Recall that anti-aliasing means adding interpolated pixels to create a soft, feathered line.) Changes made to a selection that is not anti-aliased apply only to pixels within the selection. Changes made to an anti-aliased selection bleed through to the pixels directly adjacent to the selection.

The following sections discuss three popular Photoshop selection tools: the Marquee, Lasso, and Magic Wand tools.

## Marquee Tools

Use the Marquee tools to select areas of images. Selection areas constrain the effects of filters and tools. Figure 4-28 shows selection areas defined with the Rectangular and Elliptical Marquee tools. To select a Marquee tool, click and hold the Rectangular Marquee tool in the toolbar, and then click the tool you want in the palette. Drag across the image to define the selection area.

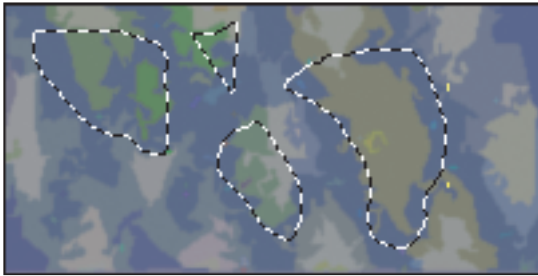
Two tools you often use for photo retouching are the Rectangular Marquee tool and the Elliptical Marquee tool. Use the Rectangular Marquee to create rectangular selection areas. Use the Elliptical Marquee to create elliptical selection areas. For both of these tools, you can set the selection to maintain a fixed aspect ratio by holding down the Shift key as you drag. Doing so creates a perfect square or circle. If you already have selected an area, hold down the Shift key and then use a Marquee tool to select additional areas.



**Figure 4-28** Using the Rectangular and Elliptical Marquee tools

## Lasso Tools

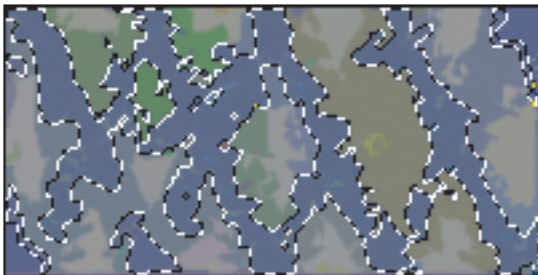
The Lasso Tools in Photoshop let you draw a selection around specific pixels, as shown in Figure 4-29. While the Marquee tools define geometric selections, you use the Lasso tool to draw a selection line of any shape around an area. Use the Polygonal Lasso tool to create geometric selections with any number of lines and corners. Holding down the Shift key constrains the Polygonal Lasso Tool to 45° angles. Holding down the Ctrl key and clicking stops selecting. The Magnetic Lasso Tool is intelligent because as you select an area, it finds the nearest edge and sticks there.



**Figure 4-29** Using the Lasso tool

## Magic Wand Tool

The Magic Wand tool shown in Figure 4-30 also is intelligent. When you select a pixel with the Magic Wand Tool, it selects that pixel and every adjacent pixel of similar color. What counts as similar is determined by the Tolerance value in the Magic Wand Options dialog box. A setting of 0 means only pixels of the exact hue, saturation, and lightness are selected with the original pixel. A higher setting makes the tool select pixels which are similar in color. By default, the Magic Wand tool selects only adjacent pixels. You also can select nonadjacent pixels with the Magic Wand tool when the Contiguous box in the Options bar is unchecked.



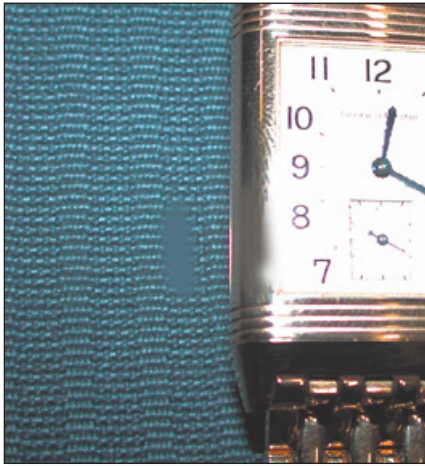
**Figure 4-30** Using the Magic Wand tool

## Using Other Photoshop Tools to Retouch Photographs

In general, you use Photoshop tools to adjust images in two ways: you use a filter to affect the whole image or a selected area of the image, or you use a brush tool to draw over the area you need to change. The following sections discuss both of these techniques, and also explain how to fix common problems such as red eye and poor lighting.

### Using the Airbrush Tool

Use the Airbrush tool to fix minor blemishes in areas of fairly even color. In Figure 4-31, the Airbrush tool has been used to minimize the glare in the glass. The Airbrush tool is inappropriate for fixing textured surfaces such as the background cloth, however, where it leaves an obvious mark.



**Figure 4-31** Using the Airbrush tool

The Airbrush tool paints a feathered line on an image. The Airbrush tool is similar to the Paintbrush tool, except the line created has a softer edge. Before applying the Airbrush to an image, pick the color you want to use. Use the Eyedropper Tool to select a color in the area you want to airbrush. If the area is textured, set the Eyedropper options in the Options bar to a  $5 \times 5$  average sample size. Then the Eyedropper collects the 25 nearest pixels and averages their colors to set the foreground color.

After you select the color for the Airbrush, use a selection tool to select the area you want to airbrush; keep in mind that you want to affect only the problem area. In the Options bar, you can set the Airbrush options to low pressure, such as 10%. This creates a soft, mostly transparent line. A high pressure creates a heavier, more opaque line. If you want to make delicate edits, set the Airbrush tool to fade after a given number of steps. This prevents you from inadvertently painting too much on the image.

Start out with a small, soft brush. As you grow more comfortable with airbrushing, use higher pressure, turn off the fade, and use a larger brush.

### Using the Dust & Scratches Filter

Photoshop has a filter explicitly designed to remove minor blemishes from photographs. Blemishes might result from dust on the camera lens or scanner bed, or from scratches in the original photo. This filter is called the Dust & Scratches filter and works by finding adjacent pixels that are of different colors, and blurring them.

To use the Dust & Scratches filter:

1. Select the **area** around the defect, or, if the image is full of blemishes, leave the image unselected.
2. To select the Dust & Scratches filter, click **Filter** on the menu bar, point to **Noise**, and then click **Dust & Scratches**. The Dust & Scratches dialog box opens, as shown in Figure 4-32.
3. Set the Radius value. Type a new value in the Radius text box, or drag the Radius slider to set the Radius value. A higher radius results in a blurrier image. Use the lowest value that eliminates the blemishes.
4. Set the Threshold value to define how different the pixels must be before they are blurred. Type a new value in the Threshold text box, or drag the Threshold slider to set the Threshold value. A low value produces a strong effect and a high value produces little or no effect. Experiment with both the Radius and Threshold sliders to find the values that remove the defects without affecting the rest of the image.
5. Click **OK** to close the dialog box.

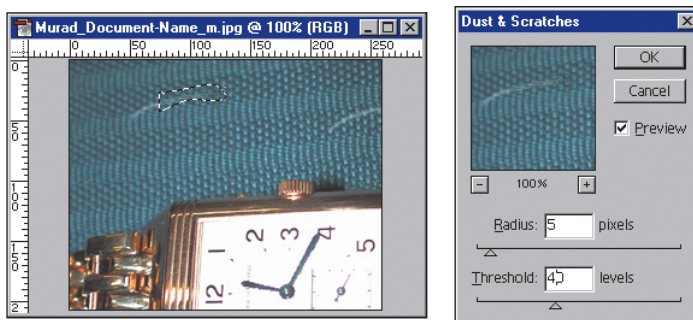


Figure 4-32 The Dust & Scratches dialog box

### Using Selective Blurring

If you do not need to remove particular elements from an image, but want only to deemphasize the background, you can selectively blur that area of the image. Blurring reduces

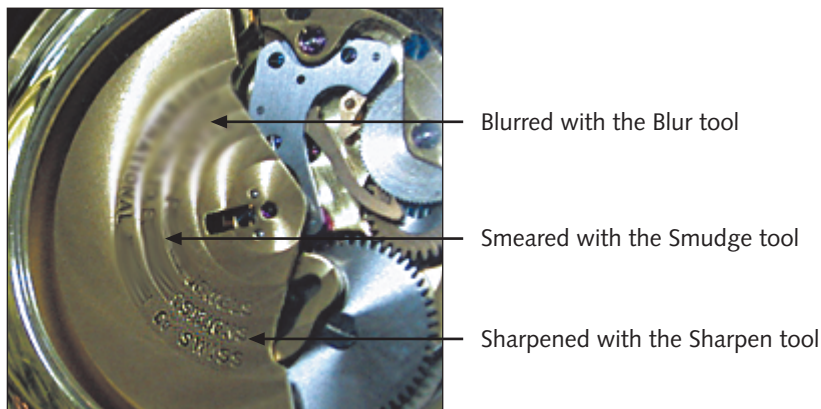
color contrast, lightness contrast, and texture contrast by blending adjacent pixels. In Figure 4-33, the left side of the background has not been blurred, and the right side has.



**Figure 4-33** Selective blurring

Begin by selecting the problem area, and then pick a blur filter. Photoshop offers several, as discussed in the Removing Patterns section, but only the Gaussian Blur lets you preview the image as you adjust the parameters. You also can use the Blur tool, which works like other brush tools but instead of applying color, it blurs the pixels you brush.

After blurring the background, you can enhance the foreground by using one of the sharpen filters. Sharpening is the opposite of blurring. Instead of reducing contrast, sharpening increases contrast by finding the differences in color and lightness between adjacent pixels and exaggerating those differences. The **Unsharp Mask** filter gives you the most control over sharpening an image. For fine detail, use the Sharpen tool. Use the Smudge tool to smear adjacent pixels. Figure 4-34 shows the Photoshop Blur, Sharpen, and Smudge tools.



**Figure 4-34** Using the Blur, Sharpen, and Smudge tools



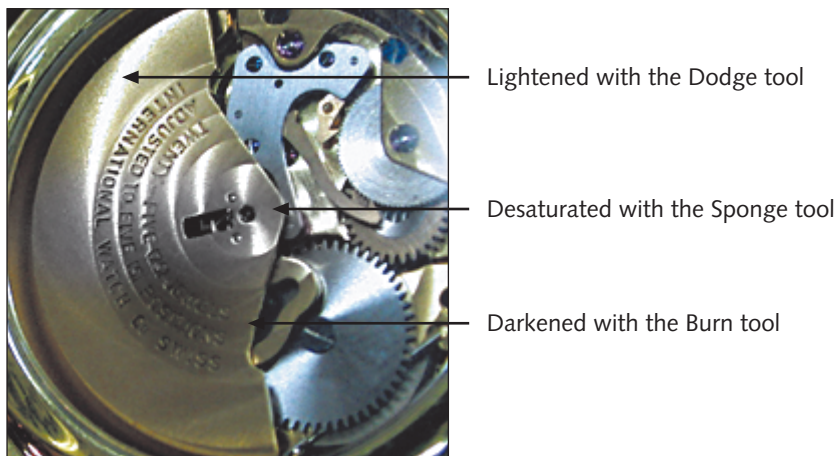
## Using Selective Saturation

In addition to blurring the background to deemphasize it, you can lower its color saturation. As discussed in the Maintain Contrast section, adjusting the color saturation of the background emphasizes the foreground and enhances the presentation of the subject.

To lower color saturation in Photoshop, open the Hue/Saturation dialog box (as instructed in the Fixing Problem Colors section), and slide the saturation slider to the left. As pixels become desaturated, they lose their hue. Reds and blues turn to black, yellows turn to white, and greens, cyans, and magentas turn to intermediate shades of gray.

For more control, use the Sponge tool. While using the Hue/Saturation dialog box is appropriate for affecting an entire image or selection area in an image, using the Sponge tool is more appropriate for making local changes to specific pixels. Select the Sponge tool from the toolbox. You use this tool to make pixels either more saturated or less saturated by selecting one of these options from the Mode menu in the Options bar.

You can apply lightness effects locally by using the Dodge and Burn tools. The Dodge tool makes pixels brighter, and the Burn tool makes them darker. All three saturation tools are illustrated in Figure 4-35.



**Figure 4-35** Using the Dodge, Burn, and Sponge tools

## Fixing Red Eye

Red eye occurs when the subject of a photograph looks directly into the camera and the light from the flash travels into the subject's eye, bounces against the back of the eye and travels back through the lens again. To reduce red eye, have the subject look away from the lens or don't use a flash. You can use Photoshop or another image editing tool to fix a photo with red eye. The quickest and easiest technique for reducing red eye is



to zoom in to the red area and paint it with an appropriate color. Red eye occurs at the pupil, so replacing the red with black usually produces a realistic effect.

For more precise control, select the red area with one of the marquee selection tools, and then open the Hue/Saturation dialog box. Click the Edit list arrow, and then click Reds to specify that you want to affect only the red pixels in the eye. Then lower the Saturation and Lightness sliders to the left to remove the red pixels from the selected area.

## Fixing Lighting Problems

Some lighting problems cannot be fixed in Photoshop. Some images have shadows so dark or highlights so bright that foreground detail is completely lost. For these photos, the best you can do is enhance the existing lights and shadows by selectively lightening and darkening the image. Your choices are to either lighten with the Dodge tool, or darken with the Burn tool.

These tools work like other brush tools, except that Burn and Dodge let you control the kind of pixels you want to change. You can set them to affect only Shadows, Midtones, or Highlights. If you want to lighten a dark area of an image, use the Dodge tool and set the Range to Shadows in the Options bar. If you want to darken middle-gray areas in an image, use the Burn Tool and set it to Midtones.

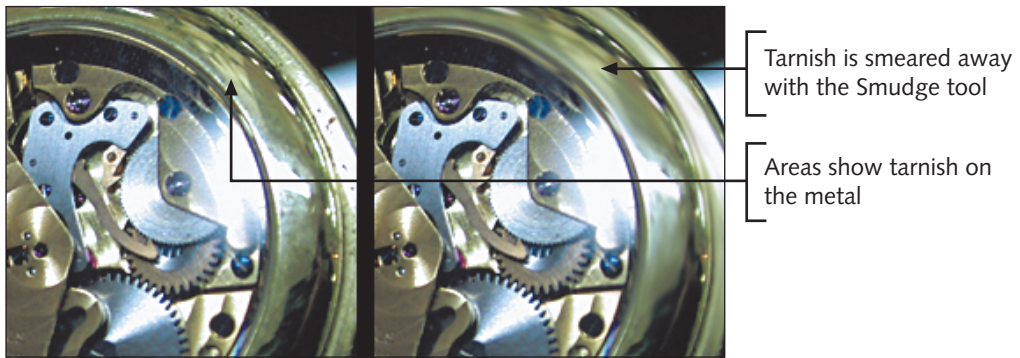
You also can select an area and use the Levels tool or Hue/Saturation tool, as discussed in the Fixing Low Contrast section, to increase or decrease the lightness.

## Replacing Unwanted Elements

Replacing unwanted parts of a photo is one of the most fun aspects of editing images. As you explore the possibilities of the tools and techniques discussed in the following sections, you will realize that photographs can no longer be trusted to be true reproductions of reality. You can use the Smudge and Clone Stamp tools to change a photograph by copying and pasting.

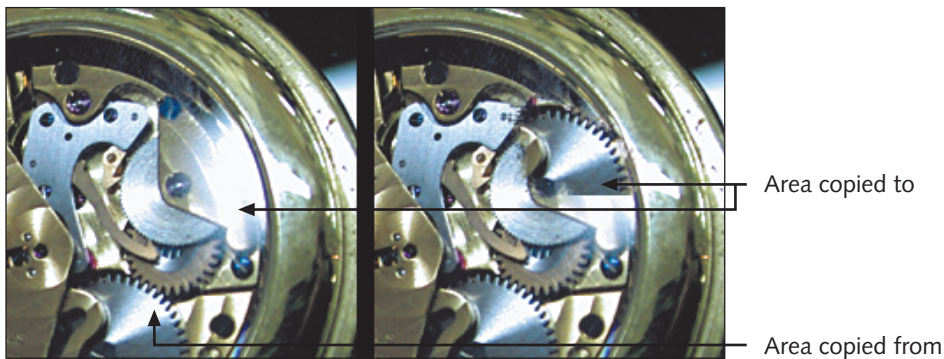
The Smudge tool copies the area under the brush, and as you drag the cursor over the image, it pastes the copied area. It does this over and over again, giving the illusion that it is actually pushing the pixels. You adjust the distance between the copy and paste locations by changing the Pressure setting in the Options bar. The pressure setting is measured in percentages and the value is the percentage of the width of the brush you use. If you set the Pressure to 0%, the Smudge tool copies and pastes the selection in the same place. If you set the Pressure to 50% and the brush you use is 6 pixels in diameter, the Smudge tool pastes the selection 3 pixels away from where it was pasted. If you set the pressure to 100%, the tool pastes the original copied area 6 pixels away. Pressure settings below 50% are barely noticeable, and remove blemishes without affecting the rest of the image. Pressure settings above 50% provide interesting visual effects but are not useful for photo retouching.

In Figure 4-36, the image on the left has areas showing tarnish on the metal. The image on the right is the same image with the tarnish smeared away with the Smudge tool.



**Figure 4-36** Using the Smudge tool

The Clone Stamp Tool (also called the Rubber Stamp tool) is similar to the Smudge Tool except that it allows you to control where to paste the copied selection. You set where to copy from by holding down the Option key on the Macintosh or Alt on a Windows computer, and then clicking. You can paste the copied area anywhere. As you drag the pointer over the image, it changes to a crosshair to show you the sample being pasted. If you select the Aligned option in the Options bar, the crosshair moves with the cursor, and is aligned to its position even when you stop dragging. If you do not select Aligned, the crosshair follows the cursor, but every time you stop dragging, the crosshair returns to its original location. When using the Clone Stamp tool, you achieve the best results by setting the brush to one of the Spatter brush heads. This leaves a random pattern, rather than a straight line. Using a normal brush often results in the edit being visible and obvious. The Clone Stamp tool, shown in Figure 4-37, lets you copy one part of an image onto another.



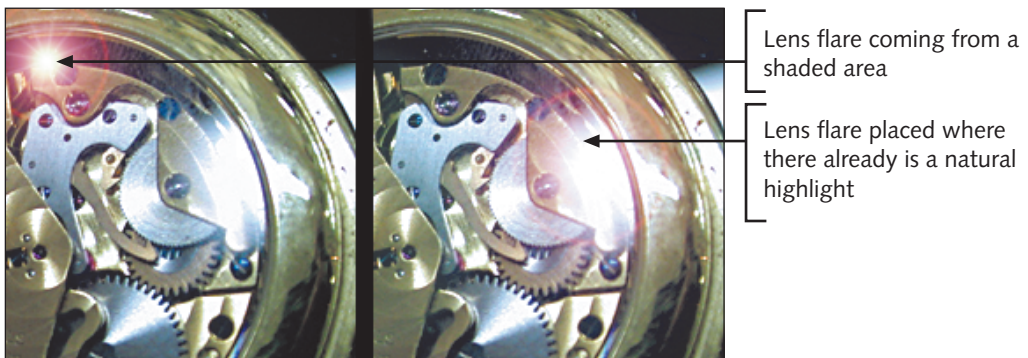
**Figure 4-37** Using the Clone Stamp tool

## Adding Lens Flare

Extensive photo retouching can reduce the realism of the original photograph and create an image that looks computer-generated, or too obviously retouched. The best way to minimize this artificiality is to be conservative when using the techniques described in the Using Other Photoshop Tools to Retouch Photographs section.

But you also can use a trick that makes these heavily edited images appear fresh again. Photoshop offers a filter under the Render submenu of the Filter menu called Lens Flare, which places artificial streaks of light in the image as though light was refracting in the camera lens. You can adjust the position and size of the flare as well as the type of lens you want to simulate. When positioning the flare, place it in the brightest area of the image. It doesn't look realistic if the lens flare is coming from a shadow; instead, place it over a light source in the image, such as a candle, window, or where light normally reflects, perhaps on glass or shiny metal.

In Figure 4-38, the image on the left has a lens flare coming from a shaded area. This looks artificial because there is nothing in the photo that could possibly cause such an effect. The image on the right has a lens flare placed where there already is a natural highlight.



**Figure 4-38** Adding lens flare

## Making Antique Photos

The Hue/Saturation dialog box contains the Colorize option. Selecting the Colorize check box preserves the brightness of the pixels in the image, but shifts the hue of each pixel to one particular value, creating a monochromatic version of the image. When colorizing an image, black stays black and white stays white, but every other color becomes a shade of the color set by the saturation slider.

By checking the Colorize option, you can create an antique effect in photographs. In the Hue/Saturation dialog box, select Colorize and then set the Hue to 30, which is orange—halfway between red and yellow. This gives the entire image the sepia color

seen in old photos. Besides creating the visual effect, colorizing reduces file size by reducing colors. Figure 4-39 shows an image colorized this way.



**Figure 4-39** Colorizing an image

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## ACQUIRING IMAGES FROM OTHER SOURCES

Using a scanner is a two-step process. First you have to find the image in an analog format, and then digitize it with a scanner. Using a digital camera is a one-step process. As soon as you click the shutter, you have a bitmap image that is ready to be used on the Web.

You can acquire images even more immediately by using images that already are in a digital form. You can take screen shots to capture images on your computer monitor, use images from stock photo CDs, or use images on other Web sites.

### Taking Screen Shots

The image you see on your computer monitor is really one large bitmap image. You can see that by taking a screen shot and capturing the desktop image. To take a screen shot within the Macintosh operating system, press shift-command-3. This captures the screen image and saves it as a file in the .pict format called Picture 1 on your hard drive.



To take a screen shot using Windows as your operating system, press the Print Screen key (Prt Sc). This saves the screen image to the Windows Clipboard. Then you can paste the image into a file in an image-editing program such as Photoshop.

### Using Stock Image CDs

When you need a photograph, but don't have time to take the picture, use stock photo CDs, which contain thousands of images. With most copyrighted images, you must give credit to the source and pay for the use of that image. With stock photos, you buy the disk and are free to use all the images. You also can buy stock photos on the Web where you can see low-resolution thumbnail versions of the images. When you find one you like, you can purchase the image, and then download a high-resolution version of the image.

Many companies also offer stock **clipart** CDs. Clipart refers to stock illustrations, images intended to be used by others. Originally these images were used in print media such as newsletters, so clipart traditionally meant images created in a vector drawing program and saved in a format such as PostScript.

In the past, to use these images on the Web, you had to first open them in a vector program and then rasterize them. Now, however, most companies that sell collections of clipart anticipate that the images will be used as Web graphics, so the images are saved in Web formats such as GIF or JPEG.

The quality of most clipart is rather low, and the style can be cartoonish, with black outlines filled in with solid colors. You probably will find clipart most useful when you need icons for a navigation bar, such as a simple mailbox to indicate an e-mail link.

Clipart collections are inexpensive to create, and you can find some for under \$30 that contain tens of thousands of images.

## Using Images from the Web

Another source of images is other Web pages. Some sites offer free online clipart and stock photo galleries. The quality of these images tends to be lower than those found on a commercial stock photo CD, but they are more accessible and are free.

To grab images from other Web sites, point to the image in a Web browser, and then click and hold the mouse button on a Macintosh, or right-click in Windows until a shortcut menu appears. The menu offers an option to save the image.

Almost every image you see on the Web has an implicit copyright, meaning someone owns permission even if it is not explicitly stated. You do not have the legal right to use images from other Web sites without explicit permission from the owners or operators of the site. Using any image violates the copyright on the image and is considered stealing.

## Considering Copyrights

Many students are tempted to pirate software and use images from other Web sites without permission. But in the professional world, you have to be more careful. When a copyright violation has occurred, the practice is for the copyright holder to first contact the violator and ask that the image be removed. If the violator refuses or ignores the request, the copyright holder can sue.

Even one pirated image on a noncommercial site is illegal. If you use many pirated images, or if the site is commercial in nature, you jeopardize your entire company.

Unless explicitly stated, every image is copyrighted by the company on whose site the image appears. Even images which seem like they should be free, such as images of famous people, news photos, or images of paintings, are probably owned and need to be licensed to be used. Using a copyrighted image and editing it to make it different from

the original does not protect you. Simply changing colors or resizing an image does not make it yours. You should always create your own images, or make sure that you have explicit permission to use images from other sources.

### Watermarking Images

Some individuals, such as professional photographers and artists, put a lot of time and effort into creating their images and want to be able to track illegal usage. Often there is no way to prove that an image is yours, especially if you have not copyrighted the image. To prove that you are the creator of an image, you can add a watermark, which is a small amount of digital information that appears as noise on the image. The watermark endures image editing, and survives even if the image is printed and then scanned again.

Before embedding a watermark, you have to register with Digimarc Corporation at [www.digimarc.com](http://www.digimarc.com), which keeps a database of registrants. They provide you a unique ID that appears in the watermark information and affirms that you are the creator of the image.

Some images cannot hold watermarks. The image must have at least some variation of color and texture. Simple figures such as graphs with areas of flat color don't hold a watermark. Larger images also disguise a watermark better; an image should be at least  $100 \times 100$  pixels, and larger if you plan to edit the image after the watermark has been embedded. Lossy JPEG compression and some filters can also degrade the watermark. So, for 24-bit images use a JPEG compression of at least 4, and run all filters before adding the watermark at the end.

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## CHAPTER SUMMARY

- ❑ You can acquire an image in a two-step analog process by drawing a figure and scanning the drawing, or in a one-step process by taking a picture with a digital camera. Or, you can gather existing images from stock photo CDs.
- ❑ A 600-dpi flatbed scanner is an inexpensive and versatile tool that you can use to digitize almost any flat source image.
- ❑ Fix scanning artifacts and Moiré patterns with the Despeckle and Blur filters.
- ❑ Fix poor color with the Levels and Hue/Saturation dialog boxes.
- ❑ Affordable digital cameras do not have the resolution of film cameras, but most can produce perfectly acceptable images to be used as Web graphics.
- ❑ When composing a photograph and editing the photo in Photoshop, use lighting, color, and texture to provide contrast between foreground and background. Utilize angles, balance, and contrast to compose an interesting and attractive image.
- ❑ Use the Blur, Dodge, Burn, and Sponge tools to apply local effects to an image.



- Use the Clone Stamp Tool to completely eliminate specific elements from an image.
- You can use stock photo and clipart images from commercial CDs, or use graphics from free image library Web sites.
- Although it is tempting to use existing images found on other Web sites, you cannot use them unless you have explicit permission to do so.

## REVIEW QUESTIONS

1. If a scanner has a resolution of 600 dpi, how many pixels does it generate by scanning an area 4½" wide and 5½" high?
  - a. 1,051,875
  - b. 2,103,750
  - c. 4,207,500
  - d. 8,415,000
2. Which image will have the lowest resolution?
  - a. A digital photograph taken with a 1-megapixel digital camera
  - b. A film photograph developed to a photo CD
  - c. A film photograph printed to slide and scanned with a slide scanner
  - d. A film photograph scanned with a 600-dpi flatbed scanner
3. What is a driver?
  - a. Hardware that controls hardware such as a scanner or printer
  - b. Hardware that controls the scanning interface software
  - c. Software that controls hardware such as a scanner or printer
  - d. Software that controls the scanning interface software
4. What do you do when you change output levels with the Photoshop Levels tool?
  - a. Increase brightness
  - b. Reduce brightness
  - c. Increase Contrast
  - d. Reduce Contrast
5. Which Photoshop Blur filter allows you to control and preview the blurring?
  - a. Blur
  - b. Blur More
  - c. Gaussian Blur
  - d. Smart Blur

6. Which Photoshop Sharpen filter allows you to control and preview the sharpening?
  - a. Sharpen
  - b. Sharpen Edges
  - c. Sharpen More
  - d. Unsharp Mask
7. What tool, filter, or dialog box would you use to remove blemishes from scanning?
  - a. Hue/Saturation
  - b. Gaussian Blur
  - c. Levels
  - d. Clone Stamp tool
8. What is the best tool for removing patterns from images scanned from magazines?
  - a. Gaussian Blur
  - b. Add Noise
  - c. Despeckle
  - d. Median
9. What is a likely resolution of an image taken with a 2-megapixel camera?
  - a.  $1024 \times 768$
  - b.  $1280 \times 1024$
  - c.  $1600 \times 1280$
  - d.  $2000 \times 1600$
10. What does ISO refer to?
  - a. Aperture opening
  - b. Focal length
  - c. Sensitivity to light
  - d. Shutter speed
11. What is the fill light?
  - a. The primary source of illumination of a subject
  - b. The secondary source of illumination of a subject
  - c. A tertiary source of illumination of a subject
  - d. A source of illumination for the background



12. Which photographic technique is easiest to repair or simulate in Photoshop?
  - a. Background
  - b. Colors
  - c. Composition
  - d. Lighting
13. What Photoshop tool, filter, or dialog box would you use to repair washed-out colors?
  - a. Clone Stamp tool
  - b. Gaussian Blur
  - c. Hue/Saturation
  - d. Levels
14. In Photoshop, what are the differences between the Dodge, Burn, and Sponge tools?
  - a. Burn lightens, Dodge darkens, and Sponge affects saturation
  - b. Dodge lightens, Burn darkens, and Sponge affects saturation
  - c. Dodge lightens, Sponge darkens, and Burn affects saturation
  - d. Sponge lightens, Burn darkens, and Dodge affects saturation
15. What tool, filter, or dialog box would you use to remove unwanted areas of an image?
  - a. Clone Stamp tool
  - b. Gaussian Blur
  - c. Hue/Saturation
  - d. Levels
16. What tool, filter, or dialog box would you use to create antique-looking images?
  - a. Clone Stamp tool
  - b. Gaussian Blur
  - c. Hue/Saturation
  - d. Levels
17. To make an antique-looking photo, to what hue value should you colorize the image?
  - a. -150
  - b. -30
  - c. 30
  - d. 150

18. Which of the following is a method you would not use to deemphasize the background?
  - a. Reduce the blurring of the background
  - b. Reduce the hue saturation of the background
  - c. Reduce the lightness of the background
  - d. Reduce the texture of the background
19. Which of the following is a method you would not use to emphasize the subject?
  - a. Blur the foreground
  - b. Saturate the foreground
  - c. Set the subject at an angle
  - d. Sharpen the foreground
20. Which of the following retouching tasks would be difficult in Photoshop?
  - a. Adding a light to illuminate the subject from the side
  - b. Blurring the background
  - c. Reducing red eye
  - d. Removing a telephone pole from a photograph

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## HANDS-ON PROJECTS

All of the following projects use Photoshop and files provided for you in the Chapter04 folder of your Data Disk, or in the Student Data/Chapter04 folder of your hard drive.



### Project 4-1: Fix a Low-Contrast Scan

Your department's graphic artist has given you a scan of a logo he drew. It's washed out and has a strong shadow. Boost the colors and remove the shadow.

1. Open the image file **4-1.tif** on the Data Disk.
2. Open the **Levels** dialog box and use **Auto Levels** to normalize the contrast.
3. Raise the Gamma to **2.00**.
4. Use the **Eraser** tool to eliminate any remaining shadows.
5. Use the **Crop** tool to remove excess margins around the image.
6. Reduce the dimensions to **150** pixels high, and save as an optimized GIF called **4-1.gif** in the Chapter 04 folder on your hard drive.



## Project 4-2: Fix a Scan with Unwanted Colors

You scanned an image to try to improve the color. The scanner lid was not flat, however, and two corners of the image developed an unwanted tint of color. Remove the unwanted color while altering the original image as little as possible.

1. Open the image file **4-2.tif** from the Data Disk.
2. Use the **Rectangular Marquee** tool to select the corner of the image with the Magenta smear.
3. Open the **Hue/Saturation** dialog box.
4. Select **Magenta** as the color you want to remove.
5. Raise the Lightness slider to **100%** and click **OK**.
6. Some of the green area became desaturated in the process. Select the affected area with the **Rectangular Marquee** tool.
7. Open the **Hue/Saturation** dialog box again and select the **Colorize** check box.
8. Set the Hue to **120**, the Saturation to **35**, and the Lightness to **10**.
9. Use a similar procedure to eliminate the green area.
10. Reduce the dimensions to **150** pixels high and save as an optimized GIF called **4-2.gif** in the Chapter 04 folder on your hard drive.



## Project 4-3: Retouch Lighting in a Photograph

An image was taken with light from a nearby window, creating harsh shadows and not illuminating the subject well. Enhance the existing lighting to emphasize the foreground more.

1. Open the image file **4-3.tif** on the Data Disk.
2. Use the Levels dialog box to normalize the contrast, and set the Gamma to **1.2**.
3. To deemphasize the background, select the **Burn** tool, set it to **Highlights** and set the Exposure to **50%**.
4. Select a brush around **50** pixels in diameter, and paint the bright areas in the background.
5. To emphasize the subject, select the **Dodge** tool, set it to **Shadows**, and set the Exposure to **30%**.
6. Use a smaller brush to daub the dark areas in the foreground.
7. Even out the lighting of the subject by using the **Burn** tool again. With the tool still set to Highlights, daub the bright areas in the foreground.
8. Normalize the levels again, optimize, and save as a JPEG called **4-3.jpg** in the Chapter 04 folder on your hard drive.



## Project 4-4: Retouch Unwanted Areas of a Photograph

In addition to poor color, an image shows unsightly power lines. Retouch the image to remove these elements from the picture.

1. Open the image file **4-4.tif** on the Data Disk.
2. Normalize levels and set the Gamma to **1.6**.
3. This reveals some of the JPEG artifacts produced by the digital camera used to take the photo. To reduce the effect of these artifacts, add noise using the Add Noise filter. Set Amount to **5**, Distribution to **Uniform**, and deselect the **Monochromatic** check box, if it is selected.
4. Select the **Eyedropper** tool, and set the Sample Size in the Options bar to **5 by 5 Average**.
5. Select the **sky** near the utility lines with the Eyedropper Tool to set the Foreground Color to the bluish-white of the sky.
6. Select the **Airbrush** tool. Set the options to **Normal, 50% Pressure**.
7. Use a 20- to 30-pixel brush, and paint over the power lines in the image.
8. Some power lines are near tree branches and cannot be painted without affecting the branches. Select the **Smudge** tool, and use a very fine brush (1 or 2 pixels). Smudge the power lines near the tree branches by pointing to the **branches**, and then dragging across the **power lines**. Zoom in with the **Magnifying Glass** tool to see what you are doing.
9. Optimize and save as a JPEG called **4-4.jpg** in the Chapter 04 folder on your hard drive.



## Project 4-5: Replace Unwanted Areas of a Photograph

A picture has unwanted elements in front of a textured background that cannot be simply painted or smudged over. Brighten the image and remove the people crossing the bridge.

1. Open the image file **4-5.tif** on the Data Disk.
2. Normalize contrast and set gamma to **2.5**.
3. Mask the existing JPEG artifacts by adding noise. Select the **lower third** of the image where the artifacts are most apparent. With the **Add Noise** filter, set the Amount to **10**, Distribution to **Uniform**, and deselect the **Monochromatic** check box.
4. With the **Magnifying Glass** tool, zoom in about **400%** where the people are crossing the bridge.
5. Select the **Clone Stamp** tool, and make sure the Aligned check box in the Options bar is selected.
6. Move the pointer over an area of the railing near the people. Hold down the **Option** key on the Macintosh, or **Alt** in Windows to change the pointer to the Clone Stamp icon. Click to select the **area** as the origin.

7. Carefully daub over the people, replacing them with nearby pixels. This technique requires some practice to get it right. Look at the History Palette to see your recent actions. You can delete any of your past actions if you decide the effect was wrong.
8. Crop the **image** to remove the excess margins. Optimize and save as a JPEG called **4-5.jpg** in the Chapter 04 folder on your hard drive.



## Project 4-6: Emphasize the Foreground of a Photograph

**4**

The background in a picture has several distracting elements. Deemphasize the background by reducing saturation, sharpness, and lightness.

1. Open the image file **4-6.tif** on the Data Disk.
2. Use the **Magnetic Lasso tool** to select the **violin** and the **case**. The tool is attracted to edges and follows the contours of the case.
3. The Magnetic Lasso does not create a perfect selection, so use the regular **Lasso** tool to add and subtract from the initial selection. Add by holding the **Shift** key, and subtract by holding the **Option** key on the Macintosh, or the **Alt** key in Windows.
4. When the selection is complete, inverse the selection by clicking **Select** on the menu bar, and then clicking **Inverse**.
5. Blur the background with the Gaussian Blur filter. Set the radius to **0.6**.
6. Some areas of the chair are particularly textured. Blur these further with the Blur tool.
7. Use the Levels dialog box to set the Gamma to **0.8**.
8. Reduce lightness and saturation with the Hue/Saturation dialog box. Set Saturation to **-30** and Lightness to **-10**.
9. Use the **Sponge** tool to desaturate the chair selectively. Set the option to **Desaturate** and use a 20-pixel brush.
10. Invert the selection again so that the violin and case are selected.
11. Use the **Unsharp Mask** filter to enhance the foreground. Set the Amount to **30%**, the Radius to **1** pixel, and leave the Threshold at **0** levels.
12. Sharpen the violin with the **Sharpen** tool. Set the Pressure to **50%** and use a 30-pixel brush.
13. Normalize levels, and boost saturation by **10**.
14. Click **Select** on the menu bar, point to **Modify**, then click **Border**. In the Border dialog box, enter a Width of **3** pixels. Apply a Gaussian Blur of **0.5** pixels.
15. Deselect to see the violin stand out in the image more than before.
16. Crop away excess margins, optimize, and save as a JPEG called **4-6.jpg** in the Chapter 04 folder on your hard drive.



## Project 4-7: Give an Image a New Background

Remove the background from an image.

1. Open the image file **4-7a.tif** on the Data Disk.
2. Use the **Magic Wand** tool and the **Lasso** tool to select all of the area behind the guitar. Set the tolerance low, around **10**; and turn **off** the anti-aliasing option for the Selection tools.
3. Inverse and then copy the selection.
4. Open **4-7b.tif** on the Data Disk.
5. Make sure it is in RGB mode, and paste the selection onto the new background.
6. Click **Layer** on the menu bar, click **Flatten Image**, and then optimize and save as a JPEG called **4-7.jpg** in the Chapter 04 folder on your hard drive



## Project 2-8: Compose the Layout of Several Elements in a Photograph

You have been given a photo of five products that will appear in an online product review. The photographer shot them in two rows, but the style of the page demands a more interesting layout. Group these objects together in one image that is 250 pixels wide and 200 pixels high.

1. Open the image file **4-8.tif** on the Data Disk.
2. Make sure the Background Color is set to **white**, and enlarge the canvas size to **500** pixels wide and **400** pixels high.
3. Select one of the objects with the Rectangular Marquee tool.
4. Select the **Move** tool and move the selected object to a new area.
5. Move all of the objects. Keep in mind the composition principles outlined in this chapter: create diagonals between objects, maintain horizontal balance, maintain vertical balance, and use margins that are about one-fifth the width of the entire image. Align your composition to the upper-left of the image.
6. When you are satisfied, select the **Crop** tool.
7. In the Options bar, select **Fixed Target Size**.
8. Set the Width to **250** pixels, and the Height to **200** pixels.
9. Drag the **Crop** tool over the image. You see that it maintains the aspect ratio of the dimensions specified in the Options bar. If the crop does not work with your layout, cancel the crop and reposition the objects. When you crop, the area will automatically scale down to 250 by 200 pixels.
10. Optimize and save as a GIF called **4-8.gif** in the Chapter 04 folder on your hard drive.

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## CASE PROJECT



For your portfolio, take your photograph and gallery pieces and clean them as described in this chapter. You should have at least one photograph of yourself and several scans or digital photos of visual work you've completed.